THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

FEBRUARY, 1898.

CONGENITAL DISLOCATION OF THE SHOULDER-JOINT.

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In the *Archives of Pediatrics*, for April, 1890, I described two cases of congenital dislocation of the shoulder-joint, occurring in children of the same family.

In medical literature, so far as I have been able to find, little has appeared to make the pathology of this deformity clear. Küster[1] operated in 1882; Phelps[2] operated once in April, 1895; F. S. Eve[3] operated in August, 1895; Phelps operated twice in November, 1895. Dr. James S. Stone, of Boston, permits me to make mention of an unpublished case of his in this connection. He operated a few months ago, in 1896, upon a child, eight months old, with a traumatic subspinous dislocation of the shoulder. No bony deformity was found. It was impossible to replace the humeral head completely. Slight improvement resulted after the operation. This case will be reported in full later by Dr. Stone. These are all the cases operated upon up to date and reported in literature.

Küster's case died; Phelps's first case proved to be a traumatic dislocation; Eve's case was also probably traumatic—there are no good notes of the operation. Phelps's other two cases are yet to be heard from. R. W. Smith's[4] original description in the Dublin *Medical Journal* still remains the only report of the pathological conditions existing in congenital dislocation of the shoulder-joint.

[1] Küster: Ein Chirurg. Wiennium, 1882, p. 256. Also Berlin klin. Wochenschrift, No. 1, p. 9.

[2] Phelps: Transactions of the American Orthopedic Association, 1896.

[3] Eve: Clinical Society Transactions, xxvii. p. 299. Roberts, J. B., Transactions American Surgical Association, 1895, xiii. p. 385, describes a subspinous case. It was not operated.

[4] Smith: Dublin Medical Journal, 1839, xv. p. 261.

I have seen in my clinic during the past winter, two patients: one a true congenital dislocation of the shoulder-joint, the other a traumatic dislocation of the shoulder-joint, occurring probably at birth. A description of these two cases follows:

CASE I.—H., a girl, aged one year and three months. The labor was very hard; the child was born without instruments, and was a head presentation. It was noticed during the first week of life that the baby's right arm and hand were somewhat swollen. An examination finds that the child holds the right arm rotated inward. The right internal condyle looks backward; the head of the humerus is felt in the infra-

FIG. 1.

CASE I.—Traumatic subspinous dislocation of right shoulder at birth. Note apparent shortening of right humerus and position of right upper extremity.

spinatus fossa. The bones of the upper extremity, including the clavicle, scapula, humerus, radius, and ulna, are of normal size and development. There is no atrophy or lack of development of the muscles of the right upper extremity, and the electrical examination shows no muscular changes. The movements at the shoulder are nearly normal, being limited somewhat in abduction and rotation outward. (Fig. 1.)

CASE II.—S. is a girl, about three years old. The child was a head presentation, and was born without instruments. The labor was not hard. At no time was there noticed to have been any injury to the right upper extremity. The position of the right upper extremity is seen in the photograph. The right elbow is held away from the side, the forearm and the humerus are both slightly flexed; the forearm is partly pronated. The humerus is rotated inward, so that the internal condyle looks backward. The head of the humerus is felt under the outer third of the spine of the scapula, a little behind the

acromion process. The voluntary movements are limited. The glenoid cavity cannot be felt. The scapula is small. If the upper extremity is rotated outward, the head of the humerus can be seen to disappear from the dorsum of the scapula and can be felt to move forward near to the normal position of the glenoid cavity. The moment rotation ceases the head of the bone returns to its former position under the spine of the scapula. While the head of the bone is near to the normal position, if an attempt is made to bring the arm to the side of the body, a movement of the scapula takes place, the humerus being locked with the scapula. (Figs. 2 and 3.)

FIG. 2.

CASE II.—Probable true congenital dislocation or misplacement of right shoulder-joint. Note shortening of right arm and position of right upper extremity.

The description of the attitude in this case might well be that of the first case, so closely do they resemble each other. In the second case, upon careful measurement of the bones of the upper extremity, the following facts are observed:

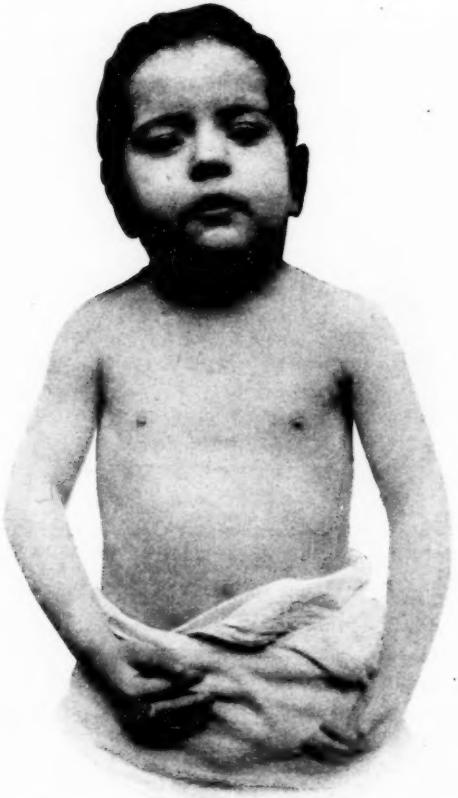
Length of right clavicle	$2\frac{7}{8}$ inches.
Length of left clavicle	$3\frac{1}{8}$ "
From acromion to external condyle of right humerus	$5\frac{1}{2}$ "
From acromion to external condyle of left humerus	$5\frac{7}{8}$ "
Length of right radius	5 "
Length of left radius	$5\frac{1}{2}$ "
Length of right ulna	$4\frac{7}{8}$ "
Length of left ulna	$5\frac{3}{8}$ "

At the level of the plane passing three-fourths of an inch above the nipple in front and through the fifth dorsal spine behind, the right chest measures ten inches and the left chest measures ten and a quarter inches. The scapula on the right side is much smaller than the scapula on the left side.

In comparing these two cases, it will be seen that in the first instance traumatism probably played an important part, as evidenced by the

swelling of the arm and the difficult labor. Such traumatic dislocations are apparently not very uncommon.

FIG. 3.



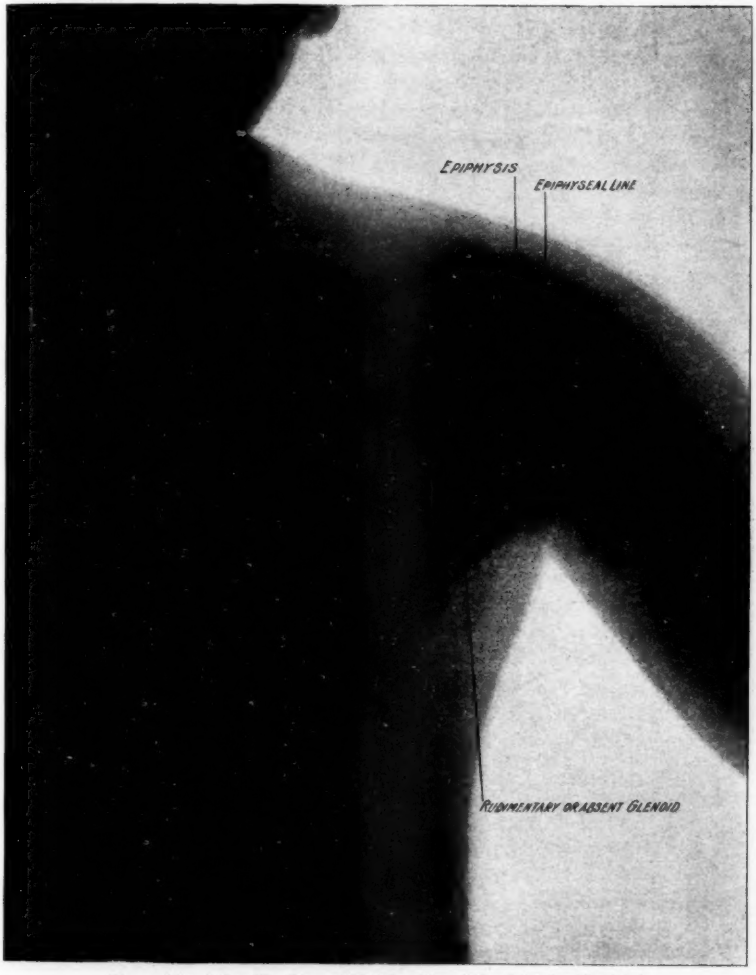
CASE II.—Congenital dislocation of right shoulder. Note small right scapula; position of right upper extremity. (3) Head of bone in abnormal position.

In the second case the facts that the labor was easy and that instruments were not used, that no disturbance of the arm was noticed during the first week or two after birth, that the child at no time carried the arm in a helpless fashion but always used it, and that there is a lack of development of all the bones of the upper extremity, seem to me to point conclusively to a congenital deformity.

The x-ray picture of this second case shows a decided difference in the bones of the two shoulder-joints. The proper interpretation of the conditions seen in the skiagraph is extremely difficult, but that the right

side differs materially in size and in outline of the bones forming the shoulder-joint is evident. The absence of bone about the region of the

FIG. 4.



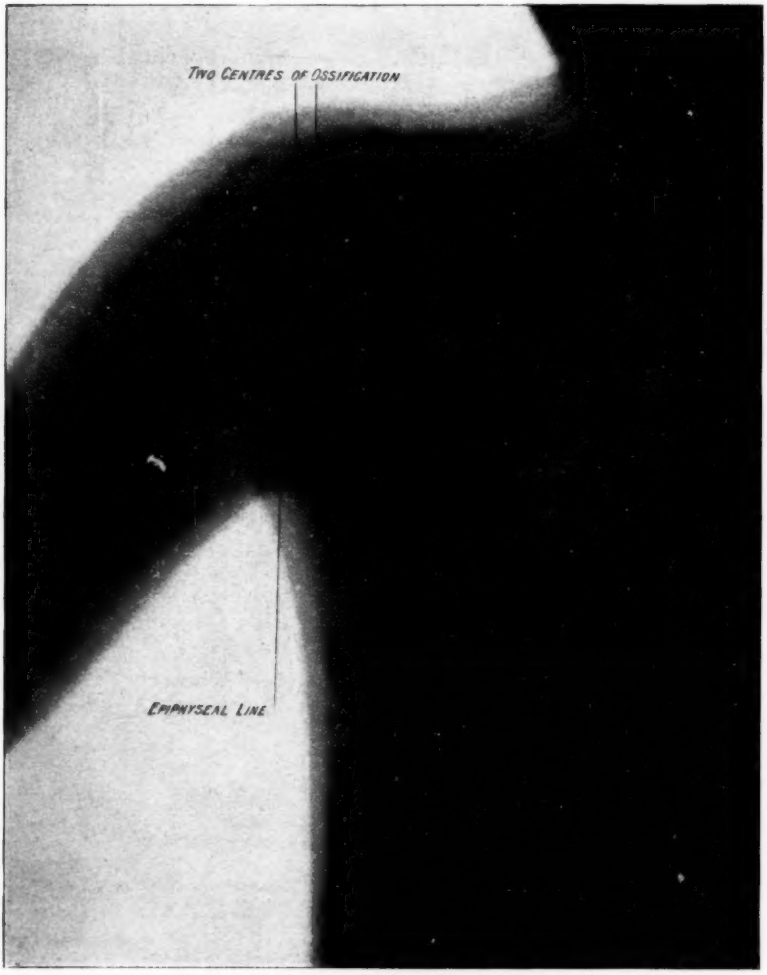
X-ray plate of Case II. Congenital dislocation of the right shoulder-joint.

glenoid is very noticeable. The small size of the humeral epiphyses is evident. (Figs. 4 and 5.)

I have found no record of accurate measurements made in other cases

of so-called congenital dislocation of the shoulder-joint; but it seems highly probable that the distinguishing feature between the purely trau-

FIG. 5.



X-ray plate of Case II. Normal left shoulder-joint.

matic disolcation of the shoulder happening at birth, and the true congenital disolcation of the shoulder is that in the true congenital dislocations there is always present a lack of development of the bones of the

upper extremity. In the two cases reported in 1890, no operation would be allowed. In the cases reported to-day, it is probable that an operation will be permitted.

From the analogy of congenital dislocations of the hip-joint, it would seem that this shoulder deformity is probably due to a lack of development of the glenoid cavity and the head of the humerus; these x-ray plates support this view, that in the normal position for the glenoid cavity there is a rudimentary glenoid, and that the glenoid cavity occupied by the rudimentary head of the humerus is developed in an abnormal position, so that, as was suggested in the report of the original two cases, the term "congenital misplacement" of the shoulder-joint would be a better term than congenital dislocation.

The operative treatment of true congenital misplacement of the shoulder-joint cannot be formulated until the conditions existing are seen and handled in any particular case.

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THE DANGERS OF TUBERCULAR INFECTION AND THEIR PARTIAL ARREST BY CLIMATIC INFLUENCES.[1]

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IN reviewing the evidence of partial arrest of tubercular infection by climatic influence, all data of a general character have to be taken with great caution. The impression that in the arid or elevated regions of the world, consumption from being so rarely seen is not communicated from the sick to the well, is not at all proved from such imperfect and unreliable statistics as have generally been brought forward. The immunizing power apparently possessed by a climate may be really due to manner of life, such as isolation; and a life, day and night, in the open air; or selected lives, such as the early settlers of any country live, who, to cope with its hardships, have of necessity to be the strongest.

It is, therefore, only after a country has been settled some little time that indoor industries, over-crowding, and the general unsanitary environment of civilization exert their full action, that any reliable data concerning climatic arrest of infection can with real accuracy be computed, since no experiment is accurate unless conditions are equal or nearly so. Conditions are now, however, favorable for comparison, as the dry and elevated regions of almost the entire world have populous cities, whose inabitants lead indoor lives, and whose environment closely approaches

[1] Read at Congress of American Physicians and Surgeons, Washington, D. C., May, 1897.

that of the dwellers in the dense civilized centres from which our statistics have for years back been taken; so that at the present day, comparative statistics of tuberculosis, collected with care, show the relation between a seaboard town and one at an elevation of six thousand feet, with a degree of accuracy and truth that leaves very little to be desired in a collection of scientific data.

I shall not burden you with a long list of dry details regarding the immunity conferred by different climates in cases of pulmonary tuberculosis. It has been found, as you no doubt are aware, that in certain elevations above the sea consumption has occurred very infrequently. On the high table-lands of India,[1] of Africa,[2] of the valleys of the Andes,[3] in some parts of Switzerland,[4] etc., consumption seems to be a rare disease, even when the population at this elevation (from three thousand feet upward) is an industrial one; and, when, as in South America and other places,[5] the natives are crowded together, favoring contagion, and have food not adapted to proper nutrition; still the rate from tuberculosis is very small as compared to the rate of deaths from this disease among the same people living at a lower altitude, although other conditions except the factor of elevation are the same. It is a law well established that consumption among all races and in all climates diminishes in a progressive ratio as we ascend from the sea-level. There are, however, exceptions to this law, but they are more apparent than real. As, for instance, in Iceland consumption is a very rare disease, as in the Hebrides and Faroe Islands,[6] also among the inhabitants of the Russian Steppes.[7] Parts of Algeria also have a singular immunity; but it is well to remark that, to a great degree, the immunity ceases to be observed when the inhabitants of the countries are brought into contact with consumption, as in the Sandwich Islands, where it was not known until the advent of the white man;[8] or when these natives change their mode of life, as to industrial indoor occupations from agricultural outdoor ones. These factors act quite as readily in trading stations in North Greenland as on the borders of the Soudan.

Elevation is the only climatic environment which seems to confer any marked immunity, as I shall show from the history of cities situated much as those in Colorado, where, notwithstanding overcrowding, indoor occupation, contact with tuberculosis in every form, the increase of the death-rate from non-imported consumption remains insignificant. Undoubtedly this is the effect of the high altitude.

There is, however, no absolute safety, no non-phthisical line to be drawn at a certain elevation. A few cases do occur at any elevation.

[1] Evans: Phthisiology, p. 55.
[2] Ibid., pp. 58 and 60.
[3] Ibid., pp. 63–232.
[4] Ibid., quoting Müller's report, pp. 15–237.
[5] Ibid., quoting Gross, p. 233.
[6] Ibid., quoting Schleisner, p. 46.
[7] Ibid., p. 47.
[8] Evans, p. 57.

I, myself, have seen three deaths from acute tuberculosis in renegade Ute Indians, who had never been out of Colorado or Utah, or been lower than six thousand feet; who had never lived in a house, and who did not use beef or milk for food; who assured me that they had never seen or been near a white man or Indian with a cough. I also saw, some months ago, a white man, an American silver miner, who had lived in the hills of Colorado for twelve years, at an altitude of never less than eight thousand feet, far from any town or any one ill in any way, and whose food, air, exercise, family history, etc., were ideally perfect from a health stand-point; yet this man had lost some forty pounds in weight in four months and presented a typical case of phthisis in the second stage, with bacilli in sputa. So that no absolute immunity does exist from consumption in mankind due to altitude and its effects. Cases do occur, as I have shown, even under the best conditions and at a very high altitude.

The fact, however, that its occurrence is so infrequent and that as we ascend higher and higher from the sea-level the cases are more infrequent, when other conditions remain the same, points to some definite climatic power at work which renders mankind less susceptidle to invasion of tuberculosis at certain elevations.

It has been to determine, if possible, what this protective influence is that I have been for the last few years engaged in investigation. I live in a city well adapted climatically to the purpose. Colorado Springs is at an altitude of six thousand feet. It has fourteen inches of annual rainfall, and, as you know, lies in our great so-called "dry plateau," the peculiar advantage being that it is well within the limited non-phthisical belt and has a population which has been engaged in indoor occupation for years, as in any Eastern city, besides having a large percentage of people infected with tuberculosis scattered among those who are well. For some twenty years consumptives have been coming to Colorado Springs, and the permanent population has been brought into close contact with them; so that, theoretically considered and from the stand-point of contagion, the population of Colorado Springs has been more exposed to the danger of infection from tubercular dust than the average city, and therefore should show at least a very large percentage of non-imported cases of consumption every year, or the climatic influence must arrest contagion, if other things are equal.

To determine the climatic effect, if any, upon germ life, I first considered the air, or, rather, the dust contained in the air and the germ life carried by this dust. The non-pathogenic micro-organisms were first taken up. The first experiment was to expose a Petri dish averaging about three square inches in area, the bottom covered with a thin layer of nutrient gelatin. After having been properly sterilized, these dishes or plates and gelatin are placed for a definite time in a certain place,

and the germs and spores of moulds gradually settle upon the surface of the gelatin. This gelatin, covered and put away, develops a colony where each germ has fallen; and by counting the colonies one can tell how many germs or moulds have fallen during the time of exposure. These exposures were made for two years during every month of the year, and every hour during the twenty-four, both indoors and out. The comparative number of germs can best be shown by comparative tables. The germs I now speak of are not, be it understood, the germs of disease, but the comparatively harmless ones common to all large cities and countries. At the same time their number in a given space of air is a standard of its purity; and, to a certain degree, the number of harmless germs is more or less of an indication of the number of harmful ones, such as consumptive germs, scattered among them.

I find that from one part of Colorado Springs, compared with a like place in New York City, as nearly as any comparison could be made, the following (taking as a standard of comparison the analysis of Dr. T. M. Prudden, of the College of Physicians and Surgeons,[1] New York City):

New York.	Colorado Springs.
Central Park, 499.	Pike's Peak Ave. (near Tejon), 89.
Union Square, 214.	Alamo Square, 23.
Private houses, 34.	Private houses, 39.
Dry-goods store, 199.	Dry-goods store, 99.
Street being cleaned, 5810.	Tejon and Huerfano Streets (a strong wind blowing, and dust), 753.

We see, therefore, from this that, although our air is not at all free from dust and germs, it still has only a moderate number, and these only in city limits.

As the plate method, however, is subject to error, I supplemented it by Miquel's method, which is to draw a given quantity of air through a tube filled with granulated sugar or sand of a certain sized grain. This sugar or sand acts as a filter, and when the air is drawn through it by an air-pump, all germs contained in the air are entangled in the sugar. This sugar is then dissolved in gelatin and the gelatin is put away. By counting the number of colonies developed in the gelatin, we know how many germs were in the air drawn through the sugar in the tube. I found by this more elaborate method practically the same result that I had obtained by the plate analysis. I made, in all, several hundred experiments. A careful record was kept of all meteorological conditions, such as temperature, wind, sunshine, character of ground, height from ground, visible dust present in the air, etc. It was found that, as is usual in all cities of all climates, the germs increased in a

[1] Dust and its Dangers, p. 26.

regular ratio as the dense centre of population was reached and more dust was raised in the air by traffic. The actual tables would be too lengthy for this paper, but the main fact was established that the air of the prairies was absolutely germless. I applied the most crucial tests to determine this point, taking as much as ten metres of air at one test; and extending my observations from twenty miles out on the prairies up into the foot-hills at least to an altitude of ten thousand feet, deep down in some of the cañons, in dense timber, and again on exposed rocky ridges. The result was always the same, provided I had used the utmost care against accidental contamination. The air of the prairies and mountains I found absolutely sterile and germless; when, however, I approached any ranch with buildings, or came near barns, houses, etc., as on the outskirts of towns, I invariably found more or less germ life.

The comparative tables are as follows:

Dr. Prudden, New York, average of germs in lecture-room in 10 litres of air:[1]
Bacteria, 11; moulds, 14.

Colorado Springs Opera House (just after performance):
Bacteria, 15; moulds, 10.

Dr. Connelly, in Dundee (Scotland) Hospital, in 10 litres of air:[2]
Bacteria, 10 to 20.

Dr. Tucker, Boston, in hospital, in 10 litres of air:[3]
Bacteria, 20; moulds, 12.

Dr. Prudden, in New York, in various hospitals, in 10 litres of air:
Bacteria, 127; omulds, 25.

Colorado Springs, in various sanitariums and hospitals, in 10 litres of air: an average of about 25 to 50 bacteria and 11 moulds. In private houses, an average of 12 bacteria and 4 moulds.

Dr. Frankland, in open space in London, found in 10 litres of air, 35 bacteria; on roof of South Kensington Museum, 279 fell on one square foot in one minute; in Hyde Park, 24 bacteria in 10 litres of air.

From the above comparison it can be seen that in the dry elevated climate of Colorado Springs the ordinary number of non-pathogenic micro-organisms are present indoors or on the streets of the city. The dryness of the air probably assists their distribution by means of dust more effectually than in a more humid climate, but the general result is the same. The only point, therefore, bearing on the practical distribution of germ life ascertained by my experiments was the unusual and absolutely sterile condition of all the air not in the immediate vicinity of human habitations. This is a most important fact. Miquel has however, found the same absence of all germ life in Europe at an elevation of from two thousand to four thousand metres above the sea-level, while in the Rue de Rivoli, Paris, he found fifty-five thousand bacteria in ten cubic metres.

[1] Ibid., p. 34. [2] Ibid., p. 33. [3] Ibid., p. 31.

I conclude, therefore, that there is very little proof that the actual number or kind of micro-organisms found in the air of a city at six thousand feet altitude has any relation to the non-development of tuberculosis; as, although the air generally is absolutely pure in our arid regions in the United States above four to six thousand feet, it is also a fact that in cities or towns at this elevation the air carries in its dust the ordinary number of bacteria and moulds that are found in cities or towns of the same population at a lower altitude, as at the sea-level.

These experiments on ordinary bacteria in the atmosphere in Colorado Springs and near by were extended so as to include a study of the separate bacteria present. Cultures were made on potatoes, agar, and other media, and the life-history of several micro-organisms not recognized from any description obtainable was made.

The result seemed to show that the climatic influence upon the development of non-pathogenic bacteria on ordinary nutrient media was negative; that dust taken from the atmosphere, out of doors or in, carried with it the usual number of ordinary bacteria and moulds that are found under similar conditions at lower altitude, combined with greater humidity; while the air obtained at a distance from buildings or roads was absolutely sterile.

The next point taken up was the effect of sunlight, combined with a minimum humidity, upon the vitality of tubercular bacilli in sputa.

It seemed reasonable to suppose that sputum, although it would become dry more rapidly in a dry air, and so prove a source of danger with less delay than under more humid conditions of the atmosphere, might also more rapidly lose its virulence exposed to a climate where the hours of sunshine are considerably in excess of those of most climates, and the diathermance of the air, or its thinness, contributing to the power of the sun's rays, acts as a germicide.

First having established the fact that fresh tubercular sputa injected into rabbits (either into the vein of the ear or the lower abdomen) produced a general tuberculosis within twenty or thirty days, quite as has been found under all climatic conditions, I selected the sputum which I had found contained tubercular bacilli, and from a patient, if possible, whose sputum had proved to be virulent at some previous time. This sputum was exposed to the direct rays of the sun for varying periods, and at different situations, with a background of sand, stone, or wood. After the exposure to the sun the sputum was rubbed up with sterilized water and inoculated into the thigh of a guinea-pig.

The animal was killed in from thirty to forty days after the time of inoculation. Some thirteen guinea-pigs were inoculated with 0.3 c.c. of sputa and water. The sputum was exposed to direct sunlight for from one hour and three-quarters to twelve hours. It was found that it took more time to dry the sputa in any quantity than was anticipated, and

that, even when dried, the mass was so firm that the current of air from a blow-pipe failed to detach even minute quantities; so that, without in some way grinding up the sputa, when dried, as is done by wheels or soles of shoes, it really could not be said to be dangerous and capable of infection. The result, however, seemed to show that sputum so dried in the sun at six thousand feet altitude was quite as capable of giving local or general tuberculosis as elsewhere,[1] at least, taken as I took it, from a mass of at least two drachms, and not distributed in dust as it is inhaled. The tables show clearly the details and technique of my work, but show nothing more significant than I have stated regarding the effect of sunlight upon tubercular sputa.

The infectiousness of dust, such as exists in rooms occupied by tubercular patients, was now investigated. In each case at least a quarter to half a square yard of dust was taken by means of cotton swabs from backs of pictures and dark corners, and was suspended in sterile water; it was then inoculated into the thigh of a guinea-pig, 2 c.c. being used at each injection. As the largest hotel in Colorado Springs is more or less filled with invalids suffering from consumption, and as tourists and others in good health also frequently pass some time there in rooms that have been occupied, it was deemed of importance to determine, if possible, the infectiousness of dust from its rooms and halls. Eight guinea-pigs, therefore, were inoculated with dust taken from the walls of the hotel and walls of rooms occupied for several years. Of these eight guinea-pigs none developed any tubercular lesion, local or general. Two pigs died, respectively, on the ninth and tenth day after inoculation, and might have developed tuberculosis; but, as all their organs and glands were perfectly healthy, and showed no evidence after careful search for tuberculosis, it is doubtful.

These guinea-pigs were freshly imported from Ohio, and were inoculated within seven days of arrival in Colorado, allowing no time for them to become acclimated; and in this sense they represented travellers or tourists and not natives, whose immunity might possibly be due to prolonged residence at an altitude. The animals were kept in separate cages in a room twelve feet by six, where only a limited amount of sunshine ever penetrated, and the air space was also insufficient to make the experiment as severe as possible. In fact, my loss from this cause was a serious drawback to my work, and the pigs lost on the average one-half ounce in weight in forty days. The animals were killed after the thirty-seventh day, this being the time deemed sufficient for infection, as it had been found that animals inoculated with dried tubercular sputa and dust showed clear evidence of general tuberculosis, as a rule,

[1] Delepine and Ransome: Report on the Disinfection of Tubercular Infected Houses. British Medical Journal, February 10, 1895.

earlier than reports from experiments of like nature at a lower altitude indicated.

The non-infection of the dust was, no doubt, partially due to the general cleanliness observed, as after a room is vacated it is most carefully cleansed, fumigated, carpets taken up, etc. At the same time, the personal habits of the occupant suffering from pulmonary tuberculosis, in regard to his disposal of sputa expectorated, was in no way controlled, and was often, doubtless, careless in the extreme; and under the conditions present (judging from similar experiments made at lower altitudes) some of the guinea-pigs should have developed tuberculosis. Hance, to be sure, only lost five guinea-pigs out of eighty-one inoculated from dust taken from buildings of the Adirondack Cottage Sanitarium.[1] But in these buildings efforts are directed with great care toward a prompt disinfection of all sputa, a condition unknown in the occupied rooms examined by me, whose occupants were under no restrictions as to the care of the expectorated matter, ventilation, etc.

I also obtained dust from walls of rooms in a sanitarium filled with consumptive patients. Three of the rooms were occupied at the time by patients in the third stage of phthisis, who had to use cloths to receive their sputa. Dust was also taken from the general sitting-room, occupied by several patients all day. Four guinea-pigs were inoculated. One died on the twentieth day; no evidence of tuberculosis was found. The others were killed on the thirty-seventh day, and were free from disease. This result was only to be expected, as the very greatest care is exercised in this institution to insure a safe disposal of all tubercular sputa. Sanitary cuspidors are used and burned, and strict rules against expectorating anywhere else are rigorously enforced, except in the case of those bedridden, who use cheese-cloth, as mentioned.

The next experiment was to determine, if possible, how readily a guinea-pig could be infected through the air alone by dried sputa. Four guinea-pigs were confined in a cage, the sunlight, air-space, and ventilation of which resembled, in proportion to the weight, as nearly as possible, a room or rooms occupied by a consumptive patient in the city. Cheese-cloth rags were then washed in tubercular sputa of a known virulence and hung about, so as to infect the air when dried, although not to come actually in contact with the animals. Unfortunately, these guinea-pigs all died, from some unknown cause, too soon to make this test of value, and I shall repeat it.

In these experiments I have, it is true, been obliged to confine myself to so few animals as to preclude the possibility of any percentages being made, but it is only fair to state that the technique was conducted with

[1] A Study of the Infectiousness of the Dust in the Adirondack Cottage Sanitarium. Medical Record, 1896.

great care, and in the case of dust taken from the hotel and sanitarium twelve guinea-pigs inoculated showed no trace of tubercular or septic infection. The control animals inoculated with sputa or with sputa and dust, with hardly an exception, developed local or general tuberculosis. I did not reinoculate any nutrient media to determine whether the lesions were produced by dead tubercular bacilli, but all nodules were examined microscopically, and the evidence of actual tuberculosis was most convincing.

This opinion is not entirely based upon the report given. Some two years ago I inoculated in all fifty-eight rabbits with dust from twelve private houses, three hotels, two hospitals, and some public buildings, using as control experiments pure culture mixed with dust. I was so unfortunate as to lose practically the result of this work, as the brass tags on the rabbits were all changed by my assistant; also some rabbits were eaten by dogs, and some escaped. But enough data of a general character were obtained to prove at least the rarity of tubercular infection from any dust collected in houses, hospitals, etc., in Colorado Springs; also the infrequency of acute septic infection after inoculating with such dust—a fact I had seen strikingly illustrated in a surgical practice of some five years, in what was then the frontier of Colorado, far from any aseptic aids.

In taking dust from a general hospital in Colorado Springs, where there were many surgical cases in public wards, I did not lose 2 per cent. of my rabbits from septic infection. Cornot lost fifty-four guinea-pigs out of ninety-four by acute infection from dust from hospitals. Hance lost 55½ per cent. of them from acute infection after they were inoculated with dust from tubercular wards of a hospital in New York; and he points out the significant facts that mixed infection is so serious that a simple tuberculosis can be changed to a mixed infection in an atmosphere laden with infective germs, and that out of 543 guinea-pigs inoculated with dust 316 guinea-pigs, or 58 per cent., died of some septic disease developed by germs contained in the dust. In my experiments, out of fifty-eight rabbits inoculated with dust from hospitals and like places where ill people were collected, I lost but two animals from acute septic infection. Rabbits are probably less likely to develop infection than guinea-pigs; but of twelve guinea-pigs inoculated with dust from hotels and sanitariums none died of septic infection.

The question was brought very forcibly to my mind, from the results of my work in this direction, as to whether we do not owe much of the improvement in tubercular cases in Colorado to the absence of the septic germs in the atmosphere, indoor as well as out, quite apart from any climatic effect upon the tubercular germ pure and simple. This, of course, could only be determined absolutely by a much more extended series of experiments than I have taken. The important point, after all,

and the most practical one, is how dangerous is it to live in Colorado Springs among consumptives? Are there any data to show the actual presence of cases that date their tubercular invasion to, in some way, contracting the disease by living in proximity to consumptives, as most well people do in Colorado Springs? In 1892 I published in THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES all cases of non-imported consumption that I could find. At that time I personally interviewed every physician in Colorado Springs, and wrote to many who had lived there, besides obtaining testimony from each and every one I could in regard to the origin of consumption in the city. After two years I found and published a list, with their histories, of ten cases that had occurred in Colorado Springs during fifteen years.

Since that time, or from 1892 to April of this year, I have been collecting statistics. A circular letter was sent to every reputable physician practising in Colorado Springs, asking for a list of his cases of non-imported phthisis, seen or heard of, during his practice, and the number of years he has practised in the city. The number of years' practice represented was one hundred and forty-four and a half. Twenty cases were reported, including the ten reported by me in 1892. At any average city at the sea-level the rate of three deaths per thousand is acknowledged to be the average. At the same ratio, a city like Colorado Springs would have had in twenty years, with its constantly increasing population, from one thousand up to twenty thousand, a total rate of six hundred and thirty deaths, while it had in twenty years ten deaths (as not all the cases reported died). In 1896[1] but one case was reported to the city physician. The average town at a lower altitude, with twenty thousand inhabitants, would show sixty deaths from tuberculosis, presumably contracted there in one year.

The objection that in Colorado Springs statistics, based on a constantly changing population, are inaccurate, does not hold. Colorado Springs, unlike most health resorts, has a permanent population. People who live there make the place their home, winter and summer, and have done so for years; many of them are engaged in indoor occupations and business life generally, quite as in any city, the proportion of tubercular to non-tubercular inhabitants being one invalid to every six people. Many of the inhabitants are predisposed to contagion by family history, having come to Colorado on account of consumption in some member of their family. The tubercular and non-tubercular mingle together in a most promiscuous manner; yet, in spite of these conditions, which have gone or for years, the actual rate of death from non-imported tuberculosis is so far below the rate in any average city in the United States as to make Colorado Springs, as a matter of fact, probably the least dan-

[1] Colorado Springs Health Department, Dr. B. H. Grover, Health Officer, 1895-96.

gerous place to live in, judged from the non-imported tubercular death-rate, about which we have any information.

Of the cases of non-imported consumption that did occur in Colorado Springs, one only could be traced clearly to infection. In this case, a robust man in the prime of life, who had lived in Colorado for eighteen years, occupied a tent with a man ill of consumption. This patient expectorated very frequently on the dusty floor of the tent, and the result was a very clear case of infection, as his companion, inside of four months, developed a cough and pulmonary hemorrhages, with bacilli in sputa, although an unusually strong and athletic man. His subsequent history was a decided improvement in El Paso, Texas, to which place I ordered him. There was a gain of forty-two pounds in weight, but then he began to lose weight, much as he did in Colorado; and on his return to Colorardo he died of tubercular laryngitis.

In all other cases there was no direct evidence of infection, but, on the contrary, those developing consumption, as far as could be observed, were far less exposed to infection than even the average inhabitant of Colorado Springs; and some of the cases lived far from any consumption or possible source of contagion, as on isolated ranches. Family history and childbirth were far more frequently the apparent predisposing cause; occupation was quite a negative factor. All were under the best conditions as regards nutriment, and no syphilis or exposure to weather could be traced. In two cases over-exertion seemed to play an important part in inducing hemorrhages; and in one case a fall from a horse had a like effect. The general result was fatal. The disease ran a more rapid course than the average case of consumption; some 80 per cent. died at the end of the second year from the time the first symptom of the disease was observed. Pulmonary hemorrhage was no more frequent in these cases than in cases contracting the disease elsewhere. The sputa showed very much the same characteristics as observed in cases that were imported; tubercular bacilli averaged in number and shape the same; there was no more and no less elastic tissue, and streptococci, with ordinary micro-organisms, showed nothing unusual due to climatic influences.

In regard, therefore, to infection, the fact that so many consumptives are brought into such close contact with well people in Colorado Springs seems, no doubt, a clear evidence that a risk in proportion to the exposure must logically result. Theoretically considered, such an opinion, based on well-known laws and statistics of other cities, would be safe to follow, other things being equal; but other things are not equal. A factor of six thousand feet altitude comes in, and, as I shall show, not theoretically but practically from statistics, this six thousand feet exerts a very strong and important action in limiting the extension of tuberculosis in Colorado Springs. This is also not an isolated instance;

Colorado Springs is not alone in having such a low record. The low mortality from non-imported consumption contracted in Colorado Springs has its counterpart in other cities in this elevated dry belt. Even Denver, a city of 150,000 inhabitants, with tall buildings shutting out the sunlight, industrial occupations which are so conductive to tubercular increase, and, in addition, a large proportion of consumptive invalids scattered among its other inhabitants, had, as shown by the reports, only sixty-four deaths from non-imported consumption (less than half of a death to the thousand) in 1896.[1] The average city would show four hundred and fifty deaths per year to 150,000 inhabitants, without the climatic factor possessed by Denver. I sent out in April fifty circular letters to doctors in Utah, Arizona, Wyoming, New Mexico, and Colorado, asking the number of cases seen or heard of by them, and the number of years each had practised in his present locality. In this way I took in fairly well the dry belt, some of which was at one thousand feet altitude only. The result from answers received was two hundred and three years' observation in practice and one hundred and thirty cases of non-imported phthisis reported—fully 80 per cent. of which were either from Salt Lake City, in native Mexicans in New Mexico, or in an altitude below three thousand feet. This compares well with results observed in other parts of the world. Hirsch, in quoting Corbal, states that in the Grand Duchy of Baden phthisis increases in a regular ratio to the increase of population, due to overcrowding, but probably more especially to indoor occupations taking the place of outdoor or agricultural ones. It was also found that phthisis diminished in a regular ratio as the altitude increased, so that my results show merely what had been observed before, with the exception that a town being filled with phthisical invalids did not seem to affect the result in the slightest degree. So far as I could judge, the factors of bad nutrition, overcrowding, indoor occupations, and low altitude contributed the main factors toward the phthisical increase in a climate the effects of which are to confer an immunity from tubercular infection as a rule.

The point of interest now comes up as to what factor in a dry elevated climate confers, to such a great degree, immunity from tubercular infection. As has been shown, in very many respects the sanitary environment of people in such cities as Colorado Springs and Denver closely resembles that of the inhabitants of any average city in the United States. A constant population has lived for years, occupied in indoor occupations—a population much more exposed to contagion from dried sputa in the atmosphere than any average city, as the tubercular invalids are so markedly in excess—and then many are predisposed by family history to the disease, so that if other things were equal it would be only

[1] Denver Bureau of Health, W. P. Munn, Health Commissioner. Report for 1895-96.

logical to infer that a very large death-rate from non-imported consumption should occur. The reason that it is not so and that the death-rate is so low compared to other cities must be some climatic influence. This climatic influence, that also favors recovery from consumption, is, no doubt, composed of many factors. Very briefly, they can be stated as follows: The tubercular germ distributed as dust is much more likely to lose its virulence, exposed in a climate where the sunshine is so constantly present and the air is so thin. The air-cells of the average lungs are more used, more brought into healthy action, at an altitude of six thousand feet. The increase, as told by the spirometer and by chest measurements, is very marked in new-comers to the dry elevated climate; and it follows that organs so exercised, both by increased ventilation and by increased blood supply, do not so readily become a suitable medium for the growth of tubercular bacilli.

EXPERIMENTS TO DETERMINE THE EFFECT OF SUNLIGHT UPON TUBERCULAR SPUTUM.

Animals used, guinea-pigs. Seat of inoculation, left thigh.

Number of animals inoculated with exposed sputum.	Length of exposure.	Number inoculated with non-exposed sputum.	Of which died within 20 days with		Of which died or were killed after 30 days, having			
			Local tuberculosis.	Other diseases.	General tuberculosis.	Glands generally and spleen affected.	Glands or abscess local.	Other diseases.
1	1¼ hrs.	...	...	...	1			
4	2 h. 5 m.	...	2	1	...	1		
2	24 hrs.	...	2					
...	...	6	1	3	1	...	1	

EXPERIMENTS WITH DUST FROM HOTEL AND SANITARIUM.

Animals inoculated with dust from				No. died on 9th or 10th day.	No. died on 20th day.	No. died on 36th day.	No. killed between 36th and 40th day.	No. showing any tubercular affection.	No. died of other causes.	Number square yards dust used.
Halls of hotel.	Sleeping-rooms of hotel.	Sitting-rooms of sanitarium.	Sleeping-rooms of sanitarium.							
5	...	...	...	...	...	...	5	...	...	⅕ s. yd.
...	3	...	...	2	...	...	1	...	2	⅓ s. yd.
...	...	1	...	...	...	1	...	...	1	1 s. yd.
...	...	...	3	...	1	...	2	...	1	1 s. yd.

Date.	Experiment number.	Quantity of sterile water used to dilute dust.	Quantity of solution innoculated.	Dust taken from sanitarium or hotel.	Occupancy of rooms by phthisical patients.	Number of bacilli found in sputum of occupant.	Stage of disease patient suffering with.	Sq. yards of dust used.	Number of days animals lived after inoculation.	Extent of tubercular affection.	Died of other diseases.	Number of days animals had lived in Colorado before inoculation
March 4, 1897	1	2½ c.c.	2 c.c.	Hotel.	Halls.	.....	.....	½ sq. yd.	Killed 36 days.	Negative.	.....	7 days.
March 4, 1897	2	2½ c.c.	2 c.c.	Hotel.	Halls.	.....	.....	½ sq. yd.	Killed 37 days.	Negative.	.....	7 days.
March 4, 1897	3	2½ c.c.	2 c.c.	Hotel.	Halls.	.....	.....	½ sq. yd.	Killed 37 days.	Negative.	.....	7 days.
March 4, 1897	5	2½ c.c.	2 c.c.	Hotel.	Halls.	.....	.....	½ sq. yd.	Killed 38 days.	Negative	.....	7 days.
March 4, 1897	6	2½ c.c.	2 c.c.	Hotel.	Halls.	.....	.....	½ sq. yd.	Killed 40 days.	Negative.	.....	7 days.
March 4, 1897	7	2½ c.c.	2 c.c.	Hotel room.	4 months.	.....	.....	½ sq. yd.	Died 9 days.	Negative.	Intestinal causes.	7 days.
March 4, 1897	8	2½ c.c.	2 c.c.	Hotel room.	4 months.	.....	.....	½ sq. yd.	Died 10 days.	Negative.	Intestinal causes.	7 days.
March 4, 1897	48	2½ c.c.	2 c c.	Hotel room.	4 months.	.....	.....	½ sq. yd.	Killed 40 days.	Negative.	.....	7 days.
March 3, 1897	24	2 c.c.	2 c.c.	Sanitarium.	Sitting-room	.....	.....	½ sq. yd.	Died 36 days.	Negative.	Exposure.	6 days.
March 3, 1897	25	2 c.c.	2 c.c.	Sleeping-room, sanitarium.	4 months.	2 to 3 in field.	Third.	1 sq. yd.	Killed 37 days.	Negative.	.....	6 days.
March 3, 1897	26	2 c.c.	2 c.c.	2 sleeping-rooms in sanitarium.	4 months, 3 weeks.	2 to 3 and 10 to 15 in field.	Second.	1 sq. yd.	Died 20 days.	Negative.	Unknown	6 days.
March 3, 1897	27	2 c.c.	2 c.c.	Sleeping-room, sanitarium.	6 months.	1 or 2 to field.	Second.	½ sq. yd.	Killed 40 days.	Negative.	.....	6 days.

The blood itself is markedly changed at six thousand feet altitude.[1] It has been shown by Egger and Paul Bert in the Andes, Muntz, Vicault, Koeppe, and Woolif in Europe, that the blood in individuals living at six thousand feet and upward above the sea is increased in specific gravity, with, also, an increased number of red corpuscles and an increase of hæmoglobin, giving the blood greater power to absorb oxygen; and, with all this, also an increased muscular power of the heart, thus insuring to the blood in several ways an increased germicidal power, and, what is probably more important, a stimulation to tissue change—all of these conditions of the blood being antagonistic to tubercular infection.

The tonic effect of altitude and cold nights is, too, a stimulant of decided value to the nervous system, much as strychnine acts, by increasing the appetite, etc. There is also the dryness to be considered, the absence of moisture in the air itself being well known at any considerable altitude, the dryness of the soil probably being the more important of the two. Bowditch, Buchanan, Pepper, Trudeau,[2] Elliot—all have shown that the relation between damp soil and phthisis is a constant one; and, no doubt, some subtle influence exists by which our dry regions, such as Colorado, etc., with sandy and gravelly soil, exert an effect on the extension of tuberculosis.

Then, also, as it is now known that tubercular infection frequently arises from milk or the meat of tubercular cattle, that danger is now reduced to a minimum in Colorado and like climates. I will quote from an article of mine published elsewhere:[3] "These facts are not confined to mankind. A general immunity, from living in this country, is also found in domestic cattle. In dairy herds, where general environment, character of food, shelter, and all conditions bearing on general health are far more likely to be the same in any climate than those of man, we have the same result, viz., that consumption in the native cattle of Colorado is a most infrequent occurrence. Careful reports show that, all through a large part of the United States, cattle are sacrificed to this plague of tuberculosis or consumption, and the opinion is gaining ground that milk taken from cows so diseased and used for food is, in a large measure, responsible for many cases of consumption occurring in mankind. Reports show that some 25 to 50 per cent. of the cattle of humid and non-elevated States are tuberculous. The reports of the State Veterinary for Colorado show only 2 per cent. in our herds (when the tuberculin test has been made). I am assured that it is so rare a disease

[1] Solly, Therapeutic Gazette, February, 1896, quotes Dr. Egger's paper read at Congress für Innere Medicin, 1893.

[2] Environment in its Relation to the Progress of Bacterial Invasion in Tuberculosis. American Journal of the Medical Sciences, July, 1887.

[3] Gardiner: Letter to the Sun, New York City, April, 1897.

among Colorado cows that it is almost a curiosity; and when it does occur, it is usually either in animals that have had the worst of care as regards overcrowding or in imported animals; native cattle are nearly immune. The testimony from all over our high dry plateau, at from five to eight thousand feet altitude, is the same. So, if it is true that consumption is very often contracted by drinking milk from consumptive or tubercular cows, the fact of Colorado's cattle being so remarkably exempt from this disease only adds another factor to our safety. If only two cows to the hundred have consumption in Colorado and twenty-five to fifty to the hundred have consumption in the East and elsewhere, there is not much room for doubt as to the comparative danger from milk infection. In a drink of milk taken in any of our average cities below two thousand feet altitude we run about 30 per cent. more risk of taking consumption than we do from a glass of milk in Colorado."

An interesting question is, Will such an immunity as exists, for example, at Colorado Springs remain constant? I think that it will, for the following reasons: We know that, as regards indoor occupation, contact with tubercular invalids, and lack of sanitary precautions, the maximum danger has been about reached. For some years past all these factors have had full opportunity to exert their baneful influence, and the results show for 1896 no increase in non-imported consumption; and in the future, although it is true the city may become more crowded, this fact or danger will be clearly met and defeated by the sanitary precautions enforced, as a law passed in 1897 fines any one from one to five dollars for expectorating on the sidewalks; and the sanitary condition of the city will be constantly improved to such a degree that it is safe to predict that we can not only keep our present low percentage of infection from tuberculosis, but will even lower it in the future.

MULTIPLE SCLEROSIS IN CHILDHOOD,

WITH A REPORT OF THREE CASES.

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The first case of disseminated sclerosis occurring in a child was published by Schuele in 1871. It is at the same time one of the three cases of the kind in which an autopsy confirmed the clinical diagnosis. Schuele's case was followed by the publication of a number of English observations (Dreschfeld, Pollard, Bristowe, etc.), and in 1879 by the report of two cases from Erb's clinic by Ten Cate Hoedemaker, who, in reviewing the cases previously recorded, only accepted Schuele's and

Dreschfeld's cases as satisfactory. In 1883 Marie[18] wrote a paper on the subject, collecting in all thirteen cases from literature and adding a case observed by Charcot and himself; his list at the time included the cases Hoedemaker had refused to accept. Unger,[40] in Vienna, published in 1887 an elaborate monograph upon the occurrence of multiple sclerosis in children, and increased Marie's list of cases to nineteen, one of them a case of his own observation. A number of publications reporting one or two cases of the kind followed in the German, French, and English medical journals. In 1893 Totzke, a pupil of Mendel, in Berlin, published two new cases in a dissertation, and reviewed all the cases published after the appearance of Unger's monograph, tabulating thirty-nine cases up to date. In this country Pritchard[35] wrote a chapter on multiple sclerosis in Keating's *Encyclopœdia of the Diseases of Children*, and Sachs[37] devotes a chapter to the disease in his book on *The Nervous Diseases of Children*, bringing the subject up to current times.

Having had the good fortune to observe at the Mount Sinai Hospital Dispensary and in my private practice three cases of the disease in children during the past year, I was led to inquire into the frequency of its occurrence at this age and to study the special literature on the subject. This study has forced the conviction upon my mind that the diagnosis of multiple sclerosis in a number of the cases published as such could be fairly challenged, and that the various statistical tables include cases which should properly be classified under other headings. It is not the purpose of this paper, however, to pass judgment, case for case, upon the previously reported cases; that would hardly repay the effort. Having missed in the previous writings—even in Unger's valuable monograph—an exhaustive discussion of the diagnosis of the disease as it occurs in children, I propose, after submitting the histories of my three cases to your kind criticism, to discuss at some length this very point—the differential diagnosis. Inasmuch as recent years have added much to our knowledge of the nervous diseases of children, new types having been created and old ones modified, an effort in this direction, I trust, will not be devoid of interest.

Case I.—Anna F.,* of German parentage, nine years of age, the eldest of five children; was born spontaneously after somewhat prolonged labor. The child is said to have been blue in the face at its birth, but began to cry after a few moments. Its mother is a large, robust, perfectly healthy woman, and has never miscarried. The father is of good health, and has been a moderate drinker of beer. Of the five children, one died of scarlet fever and one of croup. There is no history of syphilis, nor does the examination of the mother and her three children reveal any indication of the disease. The other two children

* The patient was presented on October 23, 1896, before the Society of German Physicians, and was seen there amongst others by Drs. Sachs, Jacoby, and Leszynsky.

living are in perfect health, and show no signs of the disease the patient is suffering from.

Previous History.—When the child was three months old a number of furuncles broke out on the face and neck, beyond which they did not spread. Starting from one of these an attack of erysipelas developed, which spread over the face and scalp. It had hardly subsided when a relapse occurred. In all the child was ill for three weeks, high fever accompanying both attacks. At no time were there any convulsions. The mother states that soon after she noticed that the child's hands trembled. The patient was two years old before she learned how to walk and talk, the younger children learning both when nine to twelve months old. The gait of the child did not differ from that of other children. Her speech has always been slow. Two years ago she was taken with a severe attack of scarlet fever, and was sick for six weeks. For three months thereafter her speech was very much worse than before; it was so bad that her mother had great difficulty in understanding her. Then her speech gradually improved, and at present it is not much worse than before. The tremor in the hands increased after the scarlet fever. The child goes to school, but has great difficulty in "keeping up." She does not learn nearly as well as her younger brother and sister. "She is of good disposition, but not bright," according to her mother's statement. She laughs and weeps very readily, and at times immoderately, without any apparent motive.

On October 17, 1896, she was brought to me at the Mount Sinai Hospital Dispensary.

Physical Examination.—The child is rather small for her age, but otherwise well developed and in good general health. The pupils are equal, and respond well to light and accommodation. There is no nystagmus and no ocular-nerve palsy. The fundus and vision, kindly examined by Dr. Koller, are perfectly normal. There is considerable hypermetropia.

There is a slight tremor of the tongue, which is protruded straight. Facial innervation is equal on both sides. Taste and hearing are good. There is a slight general weakness of the muscular frame; nowhere any rigidity. The deep reflexes of the arms are lively, the *knee-jerks* are both *exaggerated, ankle-clonus* can be occasionally obtained from the right foot; the Achilles-tendon reflex of the left foot is very active. There is a very marked *intention tremor* present in both hands, more in the right than the left. In seizing a glass of water and attempting to drink from it the tremor is very characteristic. When the glass is full the patient is apt to wet her clothes. The amplitude of the tremor increases somewhat as the destination is approached. The degree of tremor varies considerably according to the child's emotional condition. It is very noticeable when she attempts to write. Several characteristic specimens of her handwriting were obtained.

The patient's gait is easy; there is neither ataxy nor spasticity noticeable. In running she is not as quick as other children of her age. There is no muscular atrophy, and the electric examination shows normal conditions. Her voice is *hoarse*, and has always been so; it breaks easily. A laryngoscopical examination has not been possible as yet. Her *speech* is *slow* and *monotonous* in intonation. Mentally the child is backward and deficient. In conversation she impresses one as a child of four or five would, and not even as a bright child of that age. Her

internal organs are sound; the urine is free from sugar and albumin; the bladder and rectal functions are normal.

To recapitulate briefly the conditions presented by this case, we have a child of nine years who suffered a severe attack of erysipelas when three months old and an equally severe attack of scarlet fever when seven years old. At the present day we find a marked *intention tremor* of the hands, *exaggerated knee-jerks*, and an occasional *ankle-clonus*. The *voice* is *hoarse*, *speech slow* and *monotonous*. The child is of impaired mental capacity, cries and laughs easily.

For the present suffice it to state that this symptom complex is characteristic of multiple sclerosis. A few points concerning the differential diagnosis will be referred to later on.

Case II.—Bertha S., eleven years old, of American parentage, was brought to my office in September, 1895, and was seen but a single time, as she lives in another town of this State. She is the second of two children. The older child is perfectly well. She was born at term and without difficulty. Her mother is of a nervous temperament, of average health. On the father's side there has been no indulgence in liquor and no syphilis. There is no history of previous nervous or mental disease in the family. The child was always regarded as nervous, but never had convulsions. Her eyes have always been prominent. Some years ago she suffered for some weeks from complete *ptosis of the left eyelid*, which disappeared under electric treatment. She never complains of headache, and does not vomit. There is occasional *vertigo*. For the past year she has lost control of her bladder to a great extent; at times she wets herself without knowing what is going to happen; at other times she is unable to retain her water when she feels it wants to come. At the very best she must hasten to empty her bladder in order not to wet herself. She has been *weak* and *unsteady on her legs* for the past two or three years. Of late her gait has been getting worse.

Physical Examination.—The girl is fairly well developed, of good size for her age. The head is large, rhachitic in shape, 54 cm. in circumference. The eyes are prominent, as in exophthalmic goitre. There is divergent squint, owing to weakness of the right internal rectus. There is a fine *nystagmus* while the eyes are at rest; upon extreme excursions the nystagmus increases and becomes *jerky* in character. The ophthalmoscopic picture shows optic atrophy in both eyes, more advanced in the right eye. Vision: O. D. = 10/XLV; O. S.=10/XLV. Not improved by glasses. The visual field was not determined. The pupils are large and respond to light and accommodation. There is a fine tremor of the fingers while the patient is at rest. Upon motion there is a very marked *intention tremor* (finger-pointing, glass of water tests). The tremor is about equal in both hands. There is no loss of power and no rigidity in the arms. The gait is that of an *ataxic paraplegia*, with a very evident *cerebellar grogginess* added. The child sways when standing with her eyes open, and is unable to stand with them closed. The *knee-jerks* are greatly *exaggerated*. There is right *ankle-clonus*, on the left side an increased reflex from the Achilles-tendon. There is some rigidity in the legs, but no contractures. The various special tests show considerable ataxy and disturbance of the muscular sense in the legs. Sensation is perfect in all parts of the body. The examination with the faradic current shows slightly in-

creased excitability in the muscles of the legs, otherwise normal conditions. The child is of good intelligence; is easily frightened, trembles when nervous. Speech is not affected. The pulse is 84, and the internal viscera are sound. There is no tenderness to percussion in any part of the head.

The morbid conditions presented in this case are: *optic atrophy, strabismus, nystagmus, and previous ptosis* as eye symptoms. *Intention tremor,* some *rigidity* of the legs, *increased knee-jerks and ankle-clonus, a cerebellar ataxo-paraplegic gait,* the Romberg symptoms, and loss of control of the sphincter of the bladder. The observation is in some respects, I am well aware, imperfect, as is almost always the case when but a single examination has been possible. Nevertheless, the clinical picture is sufficiently clear to allow a positive diagnosis, the diagnosis having to take account of multiple sclerosis, Friedreich's ataxy, ataxic paraplegia, tumor of the brain, and hereditary cerebellar ataxy. Friedreich's ataxy can be excluded by the exaggerated knee-jerks, and ataxic paraplegia by the eye-symptoms. The reasons for excluding brain tumor and hereditary cerebellar ataxy will be given later in the course of the discussion of the diagnosis in general.

Case III.—Anna F., aged fifteen years, of Russian parentage, was first seen at the Mount Sinai Hospital Dispensary, March 30, 1896, and was observed for some time. The family history is negative. She was born at term without any difficulty. She was always well until she was seven years of age, when she was taken ill with a severe cold, which, from the description given, may have been an attack of influenza. Shortly after this she began to have difficulty in walking, becoming unsteady on her feet, and tiring more quickly than before. At the same time her *speech,* which had been fluent, began to be *slow* and *difficult,* and her *fingers* began to *tremble* so that she could no longer sew, had difficulty in buttoning her clothes, and could not eat soup from a spoon without spilling. Her *legs* gradually became *stiff,* and the tremor in her hands has increased during the past year. She is subject to *vertigo,* which is, however, never very severe. No headache. There never has been any ocular nerve palsy and no vesical trouble.

Physical Examination.—The girl is mature for her age, broad-shouldered, and in robust general health. Her voice is harsh, and in her *speech* there is a *noticeable effort* as she slowly utters syllable for syllable with little or no variation of intonation. Her voice is also apt to break. There is no nystagmus; the pupils are equal and respond well. The ophthalmoscopic examination shows normal disks with some congestion of the veins (Dr. Koller). There is a classical, *oscillatory tremor* in her hands, which appears as soon as she moves them for any purpose. In attempting to drink from a glass of water she spills the water if the glass is more than half filled. The tremor is more vehement when the patient is nervous; at such times her head shakes. The deep reflexes of the arms are very lively. The gait is that of a *spastic paraplegia;* her toes do not, however, cling to the floor; at times there is some swaying. No Romberg. The *knee jerks* are greatly *exaggerated;* there is *ankle-clonus* on both sides, and there is some rigidity in the legs. The patient is of average mental capacity.

The *laborious speech,* the *intention tremor,* and *spastic paraplegia* in this case were so classically developed that in spite of the absence of

eye-symptoms the diagnosis of multiple sclerosis could be made without hesitation.

DIAGNOSIS.—Naturally the differential diagnosis of multiple sclerosis in childhood must follow somewhat different lines than those laid down for the same disease in the adult. From a study of the cases recorded, and of my own cases, I find that the following diseases may have to be considered in the presence of a given case:

1. Infantile cerebral palsy.
2. Syphilis of the cerebro-spinal axis.
3. Hereditary spinal ataxy (Friedreich).
4. Hereditary cerebellar ataxy (Marie).
5. Acute disseminated myelitis (Leyden).
6. Tumor of the brain.
7. Hysteria.

1. Increased myotatic irritability, spastic paralysis, and rigidity, representing various degrees of one and the same morbid condition, confined to the legs or involving all four limbs; mental impairment; partial or complete hemiplegia and strabismus are conditions common to both multiple sclerosis and the infantile cerebral palsies. In his monograph on *Cerebral Diplegias*, Freud furthermore points out that the symptoms considered most characteristic of multiple sclerosis—the intention tremor, the nystagmus, and the bradylalia—are occasionally observed in cases bearing all the marks of a cerebral diplegia. It is true it is comparatively rare that we find more than one of these three symptoms present in a case of this kind, and there is no instance on record in which all three were observed. Nevertheless, if they occur singly or two at a time, Freud argues, there is no reason why they should not occasionally be seen simultaneously; nor are the cases of multiple sclerosis common in which this symptom-triad is complete. Of the thirty-five cases reported in children I have found but nine cases (Schuele, Charcot-Marie, Hoedemaker, Dreschfeld, Totzke, Schoenfeld, and Unger) in which intention tremor, nystagmus, and bradylalia were noted. The many points in common between the two morbid conditions indicate the difficulties that may be encountered in attempting the differential diagnosis; and these difficulties are enhanced by a common etiology, both occurring after the acute infectious diseases. I have emphasized the close resemblance possible in the clinical picture of these two diseases for the reason that in a number of the cases recorded as multiple sclerosis in children the diagnosis of diplegia would have been more justifiable. Marie has voiced this view already by confessing in his *Leçons sur les Maladies de la Moelle*, in 1892, that his series of fourteen cases, published in 1883, included quite a number (*un bon nombre*) which he would to-day classify under the heading of infantile cerebral palsies. In looking over all the cases reported I find that those of Dick-

inson, Sparks, Humphreys, Cheadle, Bodson, Railton, probably one of Freund's and one of Bruns's cases, and perhaps two or three others, are cases of this kind. The majority of these were published at a time when a knowledge of the great frequency and of the clinical features of infantile cerebral palsies had not yet become common property through the writings of Gowers, Marie, Freud, Osler, Sachs, Peterson, and others.

To avoid any misunderstanding, it will be well to state here that in the large majority of cases of infantile cerebral palsy the question as to the presence of disseminated sclerosis will not arise at all; the boot is rather on the other leg—that is to say, in every case of supposed multiple sclerosis in childhood, and especially in *early* childhood, the far more common condition of infantile cerebral palsy will have to be excluded.

In spite of the close resemblance in the symptom complex of the two diseases which has been pointed out, in most if not all cases a differential diagnosis will be well possible. In this respect a consideration of the mode of onset and of the course of the disease is of supreme importance. Infantile cerebral palsy is either congenital or a disease of acute onset; in the congenital or birth-palsies a history of difficult labor, instrumental delivery, or premature birth is of great diagnostic weight. Such a history should make us exceedingly chary of making the diagnosis of multiple sclerosis in early childhood. In these cases there may be an apparent development of the symptoms as the child grows older and the disorders of motion and speech and the mental impairment become manifest. In the acquired forms of the disease, in which acute infectious diseases, endocarditis, and convulsions are the main etiological factors, the symptoms produced by the acute lesion make their appearance immediately, and there is little or no further development; on the contrary, there may be some retrogression in the symptoms, very much as in the cerebral palsies of adult life. Although the morbid process in infantile cerebral palsies may not be absolutely stationary, but may, according to Marie's views, continue as an eccentric secondary sclerosis, it is always localized—*i. e.*, it may involve immediately adjacent areas, but cannot affect distant parts of the cerebro-spinal axis.*

In disseminated sclerosis the conditions are quite the reverse. Occasionally the onset may be acute or subacute, especially in the cases which develop immediately after an acute infectious disease; but the morbid process, once started, does not cease with the first onset. It breaks out afresh again and again in any part of the cerebro-spinal axis and its

* New foci of disease may, however, develop in the presence of an endocarditis, causing recurrent embolism, or by fresh hemorrhages occurring during convulsions. Such an occurrence is very rare, and may have given rise to the diagnosis of multiple sclerosis in the case of Humphreys.

nerves, adding new symptoms to the old. Another point of distinction of considerable value is the fact that many of the symptoms in multiple sclerosis show a very marked tendency to improve and disappear. This is especially true of the ocular nerve palsies, of which we have a good illustration in the temporary ptosis noted in Case II. As Oppenheim has pointed out, the tendon reflexes, the field of vision, and the disturbances of sensation may vary even from examination to examination. To express briefly what has been explained at length, *multiple sclerosis* is a *progressive* and *retrogressive*, *infantile cerebral palsy* a *stationary* disease.

When the mode of onset and the course of the disease do not throw sufficient light upon a case, other points may furnish the desired key. In Case I. the history of a somewhat prolonged birth (first child) would justify the suspicion that it is a case of infantile cerebral palsy. Beside the fact that the course of the disease, especially the increase of the symptoms after the scarlet fever, favors the diagnosis of multiple sclerosis, I believe the following point is conclusive: In cerebral diplegia the legs are never less affected than the arms. As a general rule, they are more affected. In our case the arms are much more involved that the legs.*

Optic atrophy,† especially partial discoloration of the disks, which is almost pathognomonic of multiple sclerosis, central scotoma, or contraction of the field of vision, may furnish decisive evidence in a doubtful case.

It will be seen that no reference has been made to the presence of the cardinal symptoms of disseminated sclerosis as bearing any weight in the differential diagnosis. In this connection it may be stated that intention tremor, nystagmus, and bradylalia are the rule in multiple sclerosis and the exception in infantile cerebral palsies. In the presence of two or three of these symptoms, providing they are present beyond cavil, it will require strong evidence to the contrary to throw out the diagnosis of multiple sclerosis.

2. It is well known that in the adult *multiple cerebro-spinal syphilis* may produce conditions which it is exceedingly difficult to distinguish from multiple sclerosis, so much so that so able an observer as *Oppenheim*, who has done much to further our knowledge of the clinical course of both these diseases, only recently published some cases through *Cassirer*,[43] in which a positive differential diagnosis was not possible. Although rare, cases of this kind may occur in children, as is shown by three cases published by *Moncorvo* in an article entitled "On the Etiology of Insular Sclerosis in Children, with Special Reference to the

* Freud cites a somewhat similar case in a twin in his monograph, in which he makes the diagnosis of diplegia, p. 153. In his case there was rigidity of the legs.

† Optic atrophy is observed in rare cases of infantile cerebral palsy.

Pathogenic Influence of Hereditary Syphilis," which appeared in the *Revue Mensuelle des Maladies de l'Enfance*, 1887, vol. v. All of these three cases, occurring in children three or four years of age, and showing cutaneous lesions of hereditary syphilis, presented typical symptoms of insular sclerosis, and were diagnosed as such (Moncorvo). They all *recovered* under specific treatment. Although Moncorvo attempts to show the importance of syphilis as an etiological factor in the causation of multiple sclerosis, on the basis of these cases, we need not hesitate, I believe, in refusing to regard his cases as examples of the disease at all. They illustrate rather how well specific diseases may imitate the clinical picture of disseminated sclerosis even in the young. In one of the two cases of multiple sclerosis in children reported by Dickinson hereditary syphilis was present. There is no mention of specific treatment having been instituted.

It is not within the scope of this paper to discuss at length the differential diagnosis between multiple cerebro-spinal syphilis and disseminated sclerosis. That is a chapter in itself. Suffice it to say that the same considerations which enter into play in adults hold good in the young. In the latter we are apt to find, as in Moncorvo's cases, valuable evidence in the presence of the ordinary signs of hereditary syphilis.

3. *Hereditary spinal ataxy* shares with disseminated sclerosis a number of important symptoms—the nystagmus, the disturbance of speech, and an ataxic tremor of the extremities, which bears a certain though remote resemblance to an intention tremor. In the various articles on disseminated sclerosis in children the differential diagnosis between this disease and Friedreich's ataxy is entered into very fully. I believe that it is rarely difficult to differentiate between the two in practice. The main differences may be summed up as follows:

Friedreich's Disease.	*Multiple Sclerosis.*
Knee-jerks lost or diminished.	Exaggerated.
Eyes, pupils and fundus normal; ocular nerve palsies very rare.	Pupils frequently unequal, reflexes may be lost; discoloration of the optic disks; amblyopia; ocular nerve palsies common.
Speech halting and explosive, blurting.	Laborious, monotonous, and scanning.

Proof of heredity would be of little diagnostic value, as multiple sclerosis has been observed in more than one member of a family (Dreschfeld, Totzke, Leusch-Huber). At the Mount Sinai Hospital Dispensary I have seen multiple sclerosis in a man of thirty years, who stated that his father had suffered for many years from the same disease and had ultimately died of it.

4. According to *Marie*,[30] who first classified the atypical cases of hereditary ataxy published by Fraser,[8] Sanger Brown,[5] Nonne,[26] Klippel and Durante, and a number of other writers, giving them the name of *hereditary cerebellar ataxy*, to distinguish them from Friedreich's

disease, a distinctive feature of this type is its onset after the age of puberty. That it may occur earlier is shown by Fraser's original cases, in which it began in the third or fourth year. In Sanger Brown's twenty-one cases the disease began once each at the age of six, eight, eleven, thirteen, and twice at fourteen years—in all, six times before the age of fifteen. Recently Collins has published an interesting though atypical case in a boy of eleven years. The question as to whether multiple sclerosis or hereditary cerebellar ataxy is present may therefore arise in children as well as in adults, and does arise, for instance, in our second case.

The close similarity in the symptoms of these two diseases is evident in the following comparisons:

Hereditary Cerebellar Ataxy.	*Multiple Sclerosis.*
1. Gait, ataxic, groggy; feet wide apart.	1. (*a*) Spastic paraplegic; feet close together. (*b*) Ataxic, groggy; feet wide apart. (*c*) Ataxic paraplegic (*a*+*b*).
2. Station, Romberg's symptom absent.	2. Romberg may be present.
3. Arms, ataxy and some intention tremor.	3. Intention tremor; sometimes ataxy.
4. Oscillations and jerky movements of the head and trunk.	4. Oscillations and jerky movements of the head and trunk.
5. Exaggerated contractions of facial muscles during speaking.	5 Twitching in facial muscles during speaking.
6. Speech, hesitating and abrupt, or simply monotonous.	6. Laborious, scanning, or monotonous.
7. Eyes, jerky nystagmus; optic atrophy, contracted field of vision. The external recti muscles may be paretic or paralyzed.	7. Jerky nystagmus; optic atrophy, contracted field of vision; ocular nerve palsies.
8. Myotatic irritability increased; knee-jerks exaggerated, ankle-clonus; contractures and muscular rigidity.	8. Myotatic irritability increased: knee-jerks exaggerated, ankle-clonus; contractures and muscular rigidity.
9. Mental impairment in varying degrees.	9. Mental impairment in varying degrees.
10. Vertigo sometimes.	10. Vertigo common.
11. Vesical functions rarely affected.	11. Vesical functions more frequently disturbed.
12. Apoplectiform seizures do not occur.	12. Apoplectiform seizures occur in a small proportion of cases.
13. Heredity common.	13. Heredity uncommon.

On account of the close similarity in the symptoms of the two conditions, the differential diagnosis in a given case may be very difficult or even impossible. In Case II. the gait corresponded very well to that of hereditary cerebellar ataxy. It was ataxic, there was a tendency to reel, and there was some rigidity of the legs present. The increased knee-jerks, the optic atrophy, the amblyopia, and the jerky nystagmus all fitted well into this clinical type. The features which allowed the diagnosis to be made in favor of multiple sclerosis were (1) the history of a previous ptosis which disappeared under treatment; a temporary ocular nerve palsy is very characteristic of disseminated sclerosis. (2) The paresis of the internal rectus muscle. (3) The presence of the Romberg symptom, which is said not to occur in hereditary cerebellar ataxy.

(4) As supporting factors: the weakness of the sphincter of the bladder and the age of onset.

The absence of heredity is of no diagnostic value, as a number of isolated cases of hereditary cerebellar ataxy have been published. Some of them, it is true, may turn out to be cases of multiple sclerosis upon autopsy.

The difficulties the diagnosis may encounter are well illustrated in the following case, in an adult, which has been under my observation for more than two years:

Mrs. S., aged thirty years, born in Germany, was first seen at the Mount Sinai Hospital Dispensary on August 17, 1894. She has been married eight years and has had two children, both in good health and free from any nervous disorder. She has had four miscarriages, which were brought on intentionally. Her father died at the age of fifty-four years from hasty consumption. Her mother is fifty-nine years old, and in good health. A younger sister of the patient, though not very bright, and a brother are perfectly well. The patient's maternal grandfather was insane and committed suicide.

As a young girl the patient suffered from her fourteenth to her nineteenth year from chlorosis. Shortly after she had some weakness in her legs, especially in the right one, which, she says, she dragged; she had no pains in the legs. After two or three months, under turpentine rubbings, the trouble disappeared. Ever since, however, she states she has been a little unsteady on her legs. When she was twenty-seven years old the unsteadiness began to increase, and grew worse and worse. When she turns her head, while walking, she becomes so dizzy she is afraid of falling. She has never suffered the least pain in her legs or any other part of the body. No headache, occasional vertigo. During the past two years her hands have become unsteady, so that she cannot sew as well as formerly. She is clumsy in buttoning her clothes, and can write but with great difficulty. Both her legs and arms have grown weaker during this time. She cannot walk far without tiring. There has never been any bladder trouble.

Examination.—The patient is a well-developed woman with little adipose tissue. She walks with her feet wide apart and sways from side to side. Romberg is indicated. In the prone position there is marked ataxy of the legs, which is increased when the eyes are closed. At rest there is no tremor of the hands. Upon motion there is an irregular ataxic tremor, which is most apparent when the patient attempts to button her clothes. She fumbles about the button before she is able to catch hold of it. The tremor has not the oscillatory character seen in multiple sclerosis, and is of very much smaller amplitude. It occurs, however, only as an intention tremor. It is increased when the eyes are closed. The deep reflexes of the arms are very lively. The knee-jerks are exaggerated, and there is ankle clonus on both sides. The voice is clear; speech is deliberate, with monotonous intonation. In speaking there is excessive action of the labial muscles. The tongue is protruded straight, without twitching or tremor. The pupils respond well, and are equal in size. Upon looking upward there is rotary nystagmus in both eyes, more marked in the left. Dr. Koller kindly

examined the patient's eyes and reported as follows: Vision: O. S. = 2/LX (fingers), emmetropic; O. D. = 5/XVIII, emmetropic.

Ophthalmoscopic Examination.—Left eye: The temporal half of the optic disk is excavated and of a bluish-green discoloration. The nasal half is more grayish. The disk seems diminished in size; the outlines are not very sharp. There is some increase of interstitial tissue along the larger bloodvessels. The calibre of the retinal vessels is unchanged. The retina is thin.

Right eye: The disk is of normal size, well outlined. The temporal half bluish-green and excavated; nasal half gray. The same changes are seen about the bloodvessels as in the left eye, only in a lesser degree." Dr. Koller adds that "this picture indicates a mixture of the two main types, primary atrophy and atrophy following inflammation. It may be looked upon as a primary atrophy with increased interstitial tissue growth." The visual fields show irregular contraction for white and for green.

There is no sign of any mental impairment.

I have seen the patient on and off during the past two years. During this time she has given birth to a third child successfully, and her condition has remained about the same.

We have in this case, to sum up briefly the symptoms presented, an *ataxic, paraplegic gait*, with *cerebellar swaying, increased knee-jerks* and *ankle-clonus;* loss of dexterity and *tremor* in the *hands* upon movement; *slow speech, excessive mimetic contraction* in speaking. In the eyes, *discoloration of the disks*, with amblyopia and somewhat *contracted visual fields.*

The diagnosis of locomotor ataxy is, of course, out of the question. A combined systemic sclerosis (ataxic paraplegia) can be but part of the morbid condition in view of the ocular changes. Friedreich's ataxy can be excluded by the exaggerated knee-jerks, the optic atrophy, and the amblyopia. The case corresponds in every respect to the clinical picture of hereditary cerebellar ataxy depicted by Marie. Despite the lack of direct heredity (a strong neuropathic taint is present), I have always regarded it as a case of this type; but I have never been able to convince myself beyond doubt that it is not, after all, one of those instances of disseminated sclerosis in which the intention tremor is absent or but slightly developed, as in the cases with autopsy seen by Leube, Ebstein, Engesser,[7] Jolly, Gowers, and others. The temporary paraplegia in the legs at the age of nineteen years would rather support this view, although Marie states that remissions also occur in hereditary cerebellar ataxy.

5. In certain cases of *acute disseminated myelitis* and *encephalomyelitis* following the acute infectious diseases the symptoms of an acute or subacute multiple sclerosis are presented, more especially the intention tremor, the increased reflexes, and the scanning speech. The disease may ultimately form the basis of a typical chronic insular sclerosis, with its recurrent attacks, etc. It may, however—and that is a point of importance—subside after a longer or shorter period and end in

recovery. Thus, Leyden[14] mentions the case of a child in which he saw an acute disseminated myelitis develop after an attack of grip, and in which there was perfect recovery; and he cites similar cases in adults reported by Lenhartz and Renviers and himself. Among the cases reported as multiple sclerosis in childhood the only one that could be regarded as belonging to this type is one reported by Massalongo and Silvestri in 1893 in the *Revue Neurologique*, No. 23, in which a child of six years developed intention tremor, scanning speech, increased tendon reflexes, muscular rigidity, spastic gait, and some optic atrophy after an attack of grip. The outcome of the case is not reported. In the presence of a case of this kind it is well to remember that we may be dealing with an old case of multiple sclerosis in which the acute infectious disease has simply rekindled the quiescent chronic disease. Thus, it is not unusual to read in the histories of these cases that the symptoms increased after an attack of scarlet fever, measles, diphtheria, etc. Case I. is a case in kind.

6. *Tumor of the brain.* In an instructive paper in the *Charité Annalen*, 1889, entitled "Ein Irrthum in der Diagnose bei einem 9-jährigen Knaben der das Krankheitsbild einer Multiplen Sclerose bot," Westphal describes a case which he had published a year previously as a case of multiple sclerosis in a child, and in which the subsequent autopsy had revealed a tumor of the left optic thalamus. Gowers states that he has seen typical intention tremor in cases of tubercle in the crus and in the pons, and expresses the suspicion that in some of the cases published as examples of disseminated sclerosis in childhood there may really have been a stationary tubercle of the brain. An error of this kind will be avoided if other symptoms of brain tumor are looked for and found. In our second case the possibility of the presence of a brain tumor was considered; the ptosis some years previous to the development of the other symptoms and the vesical weakness militate against such a diagnosis. Nor was there any history of headache, nausea, or any other general cerebral symptoms. A brain tumor giving rise to a cerebellar ataxic gait would be looked for in the cerebellum or at least in the posterior fossa—a location in which the general symptoms are, as a rule, early and intense.

7. Concerning the exclusion of *hysteria*, it may be briefly stated that the presence of ankle-clonus, of nystagmus (unless congenital), or of optic atrophy excludes it at once. A case of hysteria simulating multiple sclerosis will show indisputable hysterical stigmata if they are only looked for. It may occur, however, that hysteria may complicate the organic disease, which actually happened in one of Bruns' cases, in a girl of fifteen years.

TABLE OF CASES OF MULTIPLE SCLEROSIS IN CHILDREN.

No.	Author.	Sex and age.	Previous infectious disease.	Neuropathic taint.	Remarks.
1	Barthez et Sanné. Traité clinique et pratique des Maladies des Enfants, 3d ed., Paris, 1884.	M. 10	.....	.....	
2	Idem	F. 6	.....	.....	Following convulsions from fright.
3	Bristowe. Med. Times and Gaz., 1879 .	F. 13	Measles.		Recovery.
4	Bruns. Berliner klin. Wochen., 1888, No. 5, p. 90.	F. 15			
5	Dreschfeld. Med. Times and Gaz., 1878, vol. i. p. 140.	M. 9	....	Yes.	Brothers.
6	Idem	M. 7	....	Yes.	
7	Drummond. Lancet, 1887, vol. i. p. 12.	M. 8	....	.....	Autopsy.
8	Foerster. Jahrb. für Kinderheilk., 1880, Bd. xv. p. 272.	M. 8	....	Yes.	Death; no autopsy.
9	Freund. Arch. f. Psychiat., 1891, Bd. xxii. p. 317.	M. 16	....	Yes.	
10	Ten Cate Hoedemaker. Deut. Arch. f. klin. Med., 1879, Bd. xxiii.	M. 8	....	.....	Convulsions.
11	Idem	F. 10	....	.....	Fell on head as a baby.
12	Huber. Corresp. Bl. f. Schweiz. Aertze, 1890, p. 43.	M. 7	.....	Yes.	Patient's mother had multiple sclerosis; death. autopsy.
13	v. Kezywicki. Deutsch. Med. Wochen., 1892, p. 255.	M. 13			
14	Marie-Charcot. Revue de Méd., 1883, p. 536.	M. 14	... .	.....	Recovery.
15	Massalongo and Silvestré. Revue Neurologique, 1893, p. 649.	F. 6	Grippe.		
16	Mensi, E. Riforma medica, 1892, cited in previous article.	?	?	?	
17	Nolda. Arch. f. Psychiat., 1891, Bd. xxiii. S. 565.	F. 9			
18	Oppenheim. Berl. klin. Wochen., 1887, p. 904.	M. 12	Scarlet fever.		
19	Idem	M. 13	Scarlet fever.		
20	Idem . . . . . (Neurol. Centralbl., 1890, p. 488.)	F. 14			
21	Pollard. Lancet, 1878, p 183 . .	M. 7	Scarlet fever.	.....	Doubtful case.
22	Russel. Lancet, 1889, vol. ii. p. 1120 .	F. 12	.....	.....	Injury to head.
23	Sachs, B. "Nervous Diseases of Children," Wood, New York, 1895.	F. 14	.....	.....	Doubtful case.
24	Schwenfeld. Dissertation, Berlin, 1888.	M. 15	Measles, scarlet fever, diphtheria.		
25	Idem	F. 11	Measles, scarlet fever, diphtheria.		
26	Schuele. Deut. Arch. f. klin. Med., Bd. viii. p. 223.	F. 14	Ja'ndice with nephritis at age of six.	.....	Death; autopsy.
27	Stadthugen. Jahrb. f Kinderheilk., 1884, p. 1.	M. 11	Diphtheria.		
28	Stieglitz	F. 9	Erysipelas, scarlet fever		
29	Idem	F. 11			
30	Idem	F. 15	Grippe?		
31	Totzke. Dissertation, Berlin, 1893 .	F. 11	Measles, pertussis, pneumonia	Yes.	Sisters.
32	Idem	F. 14	.....	Yes.	
33	Unger, L. Ueber Multiple Inselformige Sklerose, etc. Vienna, 1887.	M. 6	.....	Yes.	
34	Westphal. Charité Ann., 1888, p. 459 .	M. 11	Pneumonia, diphtheria.		
35	Wilson. Brit. Med. Journ., Nov. 25, 1876.	F. 8	Pertussis.	.....	Convulsions; recovery.

ETIOLOGY. Considerable interest attaches to the etiology of multiple sclerosis. Although earlier writers (Westphal, Ebstein, Charcot, Bourneville, etc.) had noted the occurrence of multiple sclerosis in isolated cases as a sequence to typhoid fever, smallpox, cholera, etc., Marie,[19] in 1884, was the first to urge more generally the significance of a previous acute infectious disease in the etiology of the malady. Although received with favor by many writers, Marie's theory has not yet been generally accepted. In 1891 Oppenheim[30] called attention to the frequency with which he elicited in his cases a previous history of metallic poisoning. In a recent publication Strümpell[38] enters a plea for the *endogenic* origin of the disease; he assumes a congenital predisposition in the tissues of the central nervous system, especially in the neuroglia, and regards the various causes assigned by other authors as merely provocative factors which arouse the latent disease.

The etiological conditions obtaining in the cases of multiple sclerosis in children may be summed up briefly as follows: In the first of my cases the first symptoms were referred by the child's mother to an attack of erysipelas in early infancy; after an attack of scarlet fever, at the age of seven years, the child's condition became worse. In Case III. the patient's mother dated the disease from a severe cold, which may have been grippe. In Case II. no etiological data could be made out. In Totzke's series of thirty-five cases collected from literature a history of a previous infectious disease was given in thirteen cases (37 per cent.); in ten cases a neuropathic taint was present. In a somewhat modified series I arrive at about the same figures (14 and 8). As far as we may judge from such small figures it would appear that both these influences are of about equal importance in the etiology of multiple sclerosis.

In conclusion, I wish to add that the prognosis in children is not quite as unfavorable as in adults. Three cases have been recorded by competent observers—Barthez-Sanné, Charcot-Marie, and Wilson—in which the symptoms justified the diagnosis and recovery took place. When we consider the well-known tendency to remissions in the course of the disease, and the fact that certain symptoms may disappear completely and permanently, it is not surprising that this tendency should occasionally result in cure. Of course, a prolonged remission must not be mistaken for a permanent cure.

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MALARIA AS A CAUSATIVE FACTOR IN OTHER DISEASES.

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Spite of all the exhaustive studies on malaria made in this country and abroad, there is still much vagueness in the minds of many practitioners as to what malaria really is and what symptoms or diseases may be justly attributed to it. Malaria is, perhaps, more of a bugbear to the profession at large than any other disease, and were all the evil effects laid at its door truly caused by this disease, it would, next to syphilis, be the disease most to be dreaded in the whole category of ills to which flesh is heir. The ignorant practitioner, unable to find a cause

for some ailment, attributes it at once to malaria, and, unfortunately, the better-informed practitioner falls into the same trap frequently and with less excuse. Malaria does not yet seem to be recognized by the profession at large as a disease with as definite a set of symptoms as typhoid or any other one of the infectious diseases. It is commonly looked on simply as some vague morbid influence existing in the earth or air, which enters in some mysterious way into the human organism, and there acts as a most virulent and long-lasting blood poison.

There is at the present time but little excuse for such ignorance in the profession at large. Twelve years have passed since Laveran published a full and accurate account of malarial fevers and their cause. It is not impossible to obtain either fresh or stained specimens of the malarial parasite, and no student should graduate henceforth from any one of the leading medical schools of this country without having a clear conception of this organism; and at those medical schools in some parts of this country where it may be difficult to obtain such specimens, all the more study should be given to the disease, so that the young medical graduate should start in practice feeling that malaria was just as definite a disease as typhoid, and should long hesitate to at once attribute to it a variety of odd symptoms, whose true cause may be at first hard to find. Malaria does undoubtedly present itself with varying symptoms, but so does typhoid, or diphtheria, or scarlet fever. To recognize the three usual types of malarial organisms is no more, and in fact, is far less, difficult than to recognize the various types of bacteria which every student is now compelled to study. The variations in the morphology of the colon, typhoid, or diphtheria bacillus are far more puzzling than any variations ever seen in the tertian, quartan, and æstivo-autumnal types of malarial organisms.

But although it is true that malaria is a disease with a definite symptomatology, and although this fact is acknowledged by the majority of able practitioners, nevertheless they are still unable to rid their minds of the old belief that it acts at times as a "humor" in the blood, and speak of patients as having a "touch of malaria." These patients, who have never had the disease, and have lived in climates free from it, are much to be pitied, for their cases are ill-studied, and as a result they are ill-treated. Only with syphilis can it be fairly compared in the multitude of effects which it is believed it may produce, and their long continuance, running over periods of ten years and more. "Touch of" is a term which most learned doctors carefully avoid using, except in this one disease—malaria; for in other cases to use it is a sign of ignorance; in almost all other maladies we speak of a "slight attack;" but a "touch of malaria" often means not that the patient has really had malaria, but has been in some way affected by a strange morbid entity, like foul air, or some other gaseous principle.

We also read of cases where it is reported that the patient was full of "malarial poison," as though the poison existed where the blood contained no organisms, or as though the poison could last indefinitely and not be eliminated from the body. There is no other poison that we know of with which this one can be compared. It reminds one of the tales of strange poisons used in by-gone times, which could be slowly but surely given to a person, and just as slowly and surely was his strength sapped, and finally he would die, and yet all evidence of poisoning would be lacking. The only difference is that such poisons could be manufactured at demand, whereas "malarial poison" is an entity unknown and not to be understood, but only conceived of as a deadly influence. In a late number of the *Boston Medical and Surgical Journal*, in an otherwise admirable article on the "Pulmonary Invalid in Colorado," there occurs the phrase "malarial stage" of phthisis, by which the author means an early stage of "debility, slight febrile movement, a quick pulse, and few or dubious signs on chest examination." We cannot help feeling that this is a very bad adjective to use in such connection, especially as it keeps up this idea about malaria, which should be got rid of, and that is its very vagueness as a disease; it is not vague, it is far more comprehensible than many other diseases which we think we understand all about.

With the idea of trying to group together the diseases or symptoms of disease, other than the typical ones, which may truly be caused by malaria, and with the hope that in this way some light may be thrown on this much-dreaded malady, I have carefully gone over the bibliography of malaria for the past twelve years, since the publication of Laveran's[1] book on *Paludism* in 1884, noting more especially the cases of malaria with rare symptomatology. All the references are taken from the *Index Medicus* of the Surgeon-General's Library at Washington, D. C. A fair comparison between malaria as seen in this country and abroad—more especially in Africa and Italy—is rendered somewhat difficult from the fact that for this country we have no comprehensive studies on the subject, since the differentiation of the organism has been accurately determined, except that of Thayer and Hewetson,[2] which deals only with the fevers met with in Baltimore, where the pernicious cases are rare.[3] These latter are probably far more common further south in the United States, but as yet we know but very little about them as they appear here. Reasoning from analogy, all we can say is that, as the milder forms in this country correspond exactly with those seen elsewhere, and as the organisms of the pernicious cases are the prototypes

[1] Laveran: Traité des fièvres palustres, Paris, 1884.

[2] Thayer and Hewetson: "Malarial Fevers of Baltimore," Johns Hopkins Hospital Reports, 1895, v.

[3] Valuable minor contributions to the study of malaria had previously been made by Osler, Councilman, and Dock.

of those seen abroad and the few pernicious cases very similar to those reported by foreigners, there is but little reason to doubt that our fevers are practically in all respects the counterpart of those seen abroad. The pernicious cases of Africa and the Roman campagna may be more severe in their effects than the majority of the same class of cases seen in this country, but till the fatal cases of fever seen in the South, many of which are probably falsely attributed to typhoid, are more carefully studied we can draw no definite conclusions.

Another class of fevers which we read much about at present in the journals are the so-called "hemorrhagic fevers," which occur in the Southern States. What these are we do not as yet know definitely. Whether they are caused by malaria, by typhoid, or by amœbic dysentery, or by some other protozoan infection, is not yet determined. Probably some cases will come under all the first three heads. However, in the *New York Medical Record*, August 8, 1896, several cases are reported of hemorrhagic fever, where the treatment was calomel and not quinine—where the author advises against quinine. The cases got well. If they were malaria, with such symptoms, they would, one may say definitely, not have recovered without quinine. But all this goes to show simply that all forms of fever in the South need to be more carefully studied than they have been in the past. It is this uncertainty which leads to much of the confusion about malaria. All we can say is that from a perusal of the foreign literature there is evidence that the pernicious cases are far more common and more pernicious than with us. Much of the misunderstanding about malaria at present depends on the fact that the blood in cases supposed to be malaria is not commonly examined; if this were regularly and faithfully done, the subject would at once be much cleared up. But a second difficulty, and almost as important a one, which acts as a stumbling-block to many practitioners, is the fact that they do not recognize that other fevers and diseases beside malaria may be associated with intermittent or daily chills, requiring a careful examination of the blood to discover the cause of these chills; and, therefore, they are apt to lay too much stress on the type of fever alone in differentiating between malaria and other diseases. It may be well here to call attention to the fact that the most benign forms of malaria —the tertian and quartan—are the really more characteristically intermittent forms, while the æstivo-autumnal form, which is the only one to give rise to pernicious cases, is more commonly associated with a steady fever, or an irregularly intermittent variety, though the fever in these cases is sometimes, but rarely, typically intermittent. In the pernicious cases the fever is almost always continuous, and shows no regular intermittent character. And yet, spite of this, many strange and rare conditions are attributed to malaria, because of their intermittent character, which, if regular, could only be attributable, as a general rule, to the

tertian or quartan fevers, which do not give rise to any such symptoms, as we know from the large number of cases reported by competent observers. If the conditions which are attributed to malaria are not regularly intermittent, then they may or may not be due to malaria, for other diseases will give rise to signs at times quite irregularly intermittent. Therefore, regular intermittency may help to confirm a diagnosis of malaria, but grave signs occurring with regular intermittency must be rare, and if due to malaria, must be dependent on the æstivo-autumnal variety, and with but few exceptions should be seen only in the autumn and winter months, when this form of malaria is prevalent.

And a third difficulty arises from the curative effects of quinine; this drug without a doubt is a specific in malaria, but at the same time it is also an excellent tonic in many other conditions, and slight febrile attacks having no association with malaria may be readily controlled by it; many of the cases of so-called malaria are attributed to it solely because the disease showed an intermittent character and was favorably influenced by quinine. Now, these two factors alone—*i. e.*, the intermittency of the fever and the beneficial effects of quinine—are not sufficient upon which to make a diagnosis of malaria in a patient who has never had the disease nor lived in a malarious climate. They are two important factors; but without a study of the family and personal (past and present) history of the case too much stress should not be laid upon them, and no doubtful case should be accredited to malaria without a careful study of the blood. It must be granted that frequently the organism may not be found on the first examination; but where a case can be kept under observation for several days it is the exception and very rare not to find the organism at some time. There is much talk about "larvate" forms of malaria—*i. e.*, forms where the organism cannot be found; many of these are undoubtedly not cases of malaria at all, and many are not sufficiently studied; but there is a third and important group of cases, which have had malaria a short time previously, and where under treatment with quinine the organisms have entirely disappeared from the circulating blood, but whose symptoms—anæmia, cachexia, etc.—are undoubtedly due to the pre-existent malaria. To this last class only should the term "larvate" be applied. In a few dubious cases in private and hospital practice it may be justifiable to tap the spleen and examine the blood drawn from that organ to make a diagnosis certain. It is not a difficult procedure, and is only attended with risk in the case of a large soft spleen [in such cases puncture should not be done], or where there is some carelessness in tapping. However, this added means of diagnosis is very seldom needed, and only mentioned as a possibility for some exceptional cases.

In the paper by Thayer and Hewetson, twenty-six conditions, occurring altogether thirty-eight times in the 616 cases reported by them, are

noted as complications in malaria. Dr. J. M. Anders[1] in 1895 reported a "statistical study of the complications of malaria," collected from three of the Philadelphia hospitals between the years 1873 and 1894 inclusive. In 1780 cases he notes fifty-two conditions occurring altogether 191 times. In these fifty-two conditions there are a few which should rather be classified as symptoms, and in the whole 1780 cases there are undoubtedly a large number which are not malaria at all. But this makes but little difference in the point which I wish to bring out, that malaria is a disease which is frequently found associated with many others, and which does not prevent other maladies from occurring in conjunction with it, but which are in no wise dependent upon it, although by many falsely so attributed. Spite of this large number of possible complications, there is still a very large number of diseases and conditions definitely attributable to malaria, as compiled from the writings of various authors. This list includes cerebral and spinal diseases, affections of the eyes, ears, nose, lungs, heart, gastro-intestinal tract, liver, spleen, kidneys, genito-urinary organs, and peripheral nervous system. This is not all that I have found, and I shall mention others further on in my paper. I have not tabulated all the various papers I have studied, for many, from the imperfect description of the cases, are quite worthless, but I will give a few striking cases of so-called malaria reported by doctors in different countries. Pantzer,[2] for example, reports seven "rare" cases of "malarial intoxication;" in not one of these was the blood examined. Some of the cases had no fever, and in none is the condition of the spleen mentioned. Diagnosis was made simply on the grounds that the patients lived in a "malarious" climate and that they improved under quinine. Murray[3] reports a case of so-called "malarial scurvy" and post-molar ulcer; here again there is no examination of the blood or spleen, and nothing said about fever. The author attributes these ulcers to malaria, as they are not apparently due to lack of vegetable diet; the natives call these ulcers "sanyak" or "sanypatik," which means literally arising from cold or chill. "Chill," unfortunately, is still an interchangeable term for malaria in the minds of many doctors. Colleville[4] reports the following case: A furuncle appeared on the upper lip of a patient nine months to a year after last attack of malaria, and yet from the whole history of the case there is no apparent connection between the cause and result in this case except in the mind of the author. Treille[5] relates a somewhat similar and equally unsatisfactory case of phlegmon on the neck; this phlegmon he speaks

[1] J. M. Anders: Journal of the American Medical Association, 1895, xxiv. pp. 916–920.
[2] H. O. Pantzer: Transactions of the Indiana Medical Society, Indianapolis, 1892.
[3] R. D. Murray: Indian Medical Gazette, Calcutta, xxi.
[4] M. Colleville: France Méd., Paris, 1884, i.
[5] A. Treille: Gaz. Méd. de Nantes, 1892-93, xi.

of as anthrax also. The patient had marked chills not affected by quinine. The author says that blood was drawn on several occasions, and different bodies characteristic of malaria were found; but the type is not mentioned. He says the microscopic and bacterioscopic examination of the pus from this phlegmon showed, beside leucocytes, a large proportion of malarial organisms—again the type is not mentioned—and the staphylococcus aureus in relatively small numbers. The patient recovered under Fowler's solution and an ointment of quinine—both excellent tonics in such a condition. The fact that the organism is said to have been found in the pus would certainly be most interesting could we believe it, and would be the first case on record in which this has occurred; but there is no reason for putting trust in the statement, and we are more willing to believe that red blood-cells or some other structural elements of the tissues were mistaken for the organism, as is so frequently done, and we only need to call attention to an article published in 1896 in the *New York Medical Record*, entitled "What is Malaria?" Treille states that he also believes one type of organism can change into another—of which there is absolutely no proof. Giura[1] recounts a case of leucocythæmia following malaria, where there was no examination of the blood made, either for counting the white cells or for the organism of malaria. And yet one more case, reported by Kirmisson,[2] of gingival hemorrhage, due to malaria; the patient was a man, aged fifty-eight years, who when eighteen had what was supposed to be malaria. When twenty years old extraction of a tooth was followed by severe hemorrhage; eight years later he had a second gingival hemorrhage, apparently without any cause; then till the year 1869 he had hemorrhages tolerably frequently, first at regular intervals of four or five months, then less frequently, coming on only at a year's interval. In 1869 he had one, and then others in 1874, 1879, and 1884, regularly at five years' intervals. These hemorrhages usually came on at night in the months of July and August, and lasted for varying lengths of time up to sixteen days. Patient had no fever, and the bleeding was not controlled by quinine. Whatever may have been the cause of these hemorrhages, they were certainly not due to malaria of any type about which we know anything. One case, however, is reported by Bastianelli[3] and Bignami, of chronic malaria, where the æstivo-autumnal organisms were found, and where there were severe cutaneous hemorrhages, also bleeding from the gums, ears, and nose. This is the only positive case I have found, and the simultaneous occurrence of the two conditions must be extremely rare. The question in such a case necessarily arises, whether there was not some other factor at work to cause

[1] A. Giura: Gaz. Med. di Roma, 1885, xi.
[2] E. Kirmisson; Gaz. hebd. de Méd., Paris, 1884, 2 S. xxi.
[3] Bastianelli and Bignami: Bull. Soc. Lancis., Roma, 1890, ix.-x.

the hemorrhages other than malaria. As I have mentioned above, "larvate" forms must be looked upon with doubt, especially when there is no examination of the blood, and the patient has neither chills nor fever, nor other diagnostic features of malaria. Intermittency, as in the case reported by Kirmisson, is absolutely no sign of malaria. Such cases as I have given only lead to confusion of the subject, and no case should be reported as due to malaria where the evidence is so feeble as that given above.

I have only studied the literature under the heading of "malaria," and it is very likely that if I had pursued the subject further and looked up diseases of special senses or organs, I might have been able to increase the list of affections said to be due to malaria or a malarious taint. Most of the material on which I depend is drawn from the Italian, French, and Spanish authors. The mass is large, but when we come to analyze it, it dwindles down rapidly, and we find that malaria is a much abused disease.

It is often hard to exactly differentiate existing conditions into symptoms directly associated with malaria and diseases consequent on malaria. Diseases may exist at the same time as the malaria, or may be induced by it; and only such conditions should be classified as symptoms as are the common conditions existing in malaria—for example, chills followed by fever, headache, and sweating, vomiting, epistaxis, herpes labialis, bronchitis, and albumin in the urine. All these occur sufficiently often to make them characteristic of malaria when a number are taken together. Many other conditions occur only in a small proportion of cases, and, while in a sense symptomatic of malaria, they cannot fairly be classed in the general symptomatology of this disease; such are some of the cerebral and spinal conditions to which I shall refer later. De Mello[1] gives the following long list of types under which pernicious malaria may occur. Cases may begin with symptoms of—

Uterine colic,
Cerebral hemorrhage,
Myelitis or meningitis,
Hæmatemesis,
Epistaxis,
Hæmoptysis,
Otorrhagia,
Metrorrhagia,
Parotitis,
Amygdalitis,
Hemorrhagia,
Hæmaturia,
Arthrodynia,
Phonophobia,
Hypergenesis,
Paralysis of sphincters,
Deafness,
Prostatitis,
Orchitis,
Myodynia,
Weakness of genital organs,
Gastric crises,
Laryngeal and vesical spasms,
Metroperitonitis,
Metro-ovaralgia,
Abortion,
Retention of urine,
Unconscious emission of urine,
Asphyxia,
Cystitis,
Erythemas,

[1] V. de Mello: Uniao Medica, Rio de Janeiro, 1885.

and still more. Further, he classifies the cases into those with tracheo-, laryngo-, broncho-, pneumo-pleuretico manifestations; or the pneumorrhagic or hæmoptoic forms, and even pneumo-phymical. One other variety is the labio-glosso-estomato-pharyngeal. Undoubtedly some of the above-named conditions are symptomatic of malaria, or may occur in conjunction with it, simply as so-called complications, but are in no wise dependent upon it as a cause. Such a complex symptomatology leads only to confusion, which is most evident in the mind of the author, who concludes his article by the startling statement that yellow fever is only a graver form of acute malaria: "le fièvre jaune n'est qu'une modalité plus grave de l'impaludisme aigue." Weber[1] gives the following list:

Severe epistaxis,	Acute purulent urethritis,	Hæmatemesis,
Intestinal catarrh,	Apneumatosis,	Abortion,
Neurasthenia,	Intermittent neuralgias,	Insanity.

Browne[2] mentions the following signs:

Metrorrhagia,	Iritis and corneo-iritis,	Neuralgic attacks,
Menorrhagia,	Neurosis (numbness) of limbs,	Sudden loss of consciousness.
Amenorrhœa.		

Sbrana[3] has the following list:

Orchitis,	Peripheral thrombosis,	Myocarditis.

Another author[4] in America mentions dropsy—general or partial—as symptomatic of malaria and also hepatic abscess. He says: "I have noticed several fatal cases of hepatic abscess after long-continued intermittents, which I attribute to chronic inflammation of that organ from intense congestion during the apyrexia of intermittents." Such is the conception of malaria as held by some authors in various parts of the world, and there is little wonder that the disease is so universally feared. But when we come to examine into the cases reported by these authors and others, we find but little method in their madness, and they cannot confirm their statements by actual and satisfactory proof. This long inventory is not a complete list of all the signs I have run across, and others will be mentioned in the discussion of various cases to be reported. I will now take up some of these signs more fully, and will show that there is little proof that malaria has anything to do with the majority of them. Of all the various uterine manifestations noted above, I have been unable to find a single case reported in detail where there was any evidence of the disturbance being due to malaria. It is possible that abor-

[1] L. Weber: Medical Record, New York, 1885.
[2] R. H. Browne: British Medical Journal, London, 1885, ii
[3] F. Sbrana: L'ufficiale sanitario Rivista d'igiene di med. prac., Napoli, 1895, viii. i.
[4] Southern Clinic, Richmond, Va., 1885, viii.

tion might be produced in some cases of exceptional severity, but I have come across no report to confirm this idea. To take up the consideration of all the signs mentioned above would be useless, for in many instances they are simply mentioned as beliefs of the author writing, and no cases are given in proof.

It may be as well here to say a few words about the possibility of congenital malaria, which is mentioned by some authors. Cima[1] reports such a case, and in the various treatises on children's diseases (*ex.* Bouchut, Steiner, Gerhardt) we find this subject referred to, but there are as yet no absolutely positive cases on record. Two possibilities exist —one that the fœtus *in utero* should, if the mother have malaria, suffer from chills at the time when the organisms segment, by the absorption of toxins which it is believed are set free at the time of segmentation, and which are rapidly and easily taken up into the system, and so give rise to chills; but simple absorption of the toxin would not account for the child having chills after birth, unless it was newly infected. The other possibility which would give rise to chills after birth, of the same general character as the mother's, would depend on the presence of lesions in the placenta, allowing direct communication of the mother's blood with that of the fœtus, and so transference of the organism into the fœtus.

As I have just mentioned the uterine manifestations, I will now take up those referable to the male genital organs. Weber, as above mentioned, reports two cases of acute purulent urethritis and says, "both were entirely free from gonorrhœa;" now neither pus nor blood was examined in these cases, and evidence is entirely wanting that the result was due to the attributed cause. Sbrana, Charvot,[2] Coronado,[3] Sutcliffe,[4] and Lardier[5] all report cases of orchitis due, as they say, to malaria. Sbrana believes such cases exist, that they are not due to parotitis or gonorrhœa, but gives no new cases. The longest and most thorough paper is by Charvot, who refers to the works on this subject by Gerard, Drago, Maurel, Bertholon, and Schmidt. He reports six cases, in none of which was the blood examined. In Cases I. and II. the patients were supposed to have malaria at the time when orchitis was present; in Case III. the patient had had slight attacks of malaria a year previously; in Case IV. attack followed malaria after about two years; in Case V. it followed on sciatica due to fatigue and cold, and the patient had had malaria some six months previously; in Case VI. the patient had had gonorrhœa, but it was quite cured. The other five patients all deny having had gonor-

[1] F. Cima: Pediatria, Napoli, 1893, i.
[2] Charvot: Rev. de Chir.. Paris, 1888, viii.
[3] T. Coronado: Cron. Méd. quir. de la Habana, 1889, xv.
[4] Sutcliffe: India Medical Gazette, Calcutta, 1895, xxx. No. 4.
[5] Lardier: Bull. méd. de Vosges, Rambervillers, 1887-88, ii.

rhœa, and there was no urethral discharge in any one of the six cases.

The author says that the diagnosis is to be made on the brisk onset; that the tumor is very painful, and that the patient may have fever running as high as 40° C. Both testicle and epididymis are involved, and the tumor is quite smooth. The acute period is shorter than in gonorrhœa. The tumefaction and induration of the epididymis do not last long. There is only slight effusion into the tunica vaginalis. The pain is usually limited to the scrotal sac, but may pass up the cord into thigh and abdomen. The very acute period lasts but three or four days. The prognosis is good, though the resolution of the tumor is slow, and takes from three to six weeks, and there may be some atrophy of the testicle. The treatment is by the use of quinine, under which the acute period is shortened, and the feverish, congestive, and painful symptoms rapidly disappear. There is an intermittent type of these forms of orchitis where there is periodic swelling and reduction of the tumor. Coronado refers to this article by Charcot, and gives a general similar description. He adds seven cases to the above; in none was there any urethral discharge and in none was the blood examined. He says the inguinal glands are at times enlarged and tender. Lardier mentions the affection, but says little about it. Sutcliffe gives the history of a man, aged forty-two years, who showed no evidence of gonorrhœa nor mumps. He first had swelling of one testicle, later of another, but the swelling did not last long. The blood was not examined.

Such is all the evidence on hand of an orchitis dependent on malaria, and it would appear to be insufficient. The fact that there was no urethral discharge in all these cases is interesting. We do not yet understand the relationship between orchitis and parotitis—there may be a similar one between orchitis and malaria; but there is one noteworthy fact in connection with these cases and other strange cases, that the authors of them are not the men who have pursued the study of malaria most diligently and under the best conditions, such as Laveran, Marchiafava, Bignami, Celli, Golgi, Thayer and Hewetson, and others, and no one of these investigators has ever, so far as I have been able to find out, come across any such cases in the many thousands they have studied. Peptonuria and albuminuria occur in a large number of cases of malaria, as in other diseases associated with fever, and there is no need for going into detail about these conditions. Acute hemorrhagic nephritis directly dependent on malaria, where the blood has been examined with positive findings, has been noted by a number of authors, and there is no doubt that it occurs, although the condition has been attributed to the effects of quinine given for its therapeutic effects in very large doses. But well-authenticated cases are reported where no quinine had been given when the condition was first discovered.

Another cause for the hemorrhagic nephritis should here be mentioned, and that is the possibility of a bacterial infection being combined with the malarial. This condition was found in a case of nephritis complicating malaria, reported by Barker,[1] and which I shall consider more fully below. In this connection a word must be said about the occurrence of hæmoglobinuria: in the 616 cases carefully studied by Thayer and Hewetson, this sign was not noted once; and Manson[2] says also that "it is not known in our colonies in the Malay country," and Stewart,[3] who gives a doubtful case, says it does not occur in Borneo. However, Pace[4] does give a case where this condition occurred associated with æstivo-autumnal malaria; the organisms were found in the blood when the patient was suffering from methæmoglobinuria. Chvostek,[5] in a short treatise on the nature of paroxysmal hæmoglobinuria, refers to malaria as a cause, but gives no cases. There would seem to be but little question that malaria may rarely be the cause of this affection, but it is probable also, from the fact that hæmoglobinuria is paroxysmal and usually associated with chills, that malaria has very frequently been falsely taken as the cause. Kelsch and Kiener[6] say that one-third of the deaths from malaria in parts of Africa are probably due to this condition, but this statement is not based on statistics, and is, to say the least, very doubtful. Diabetes and polyuria have been attributed by some authors (Mossé[7]) to malaria, but there is no case to be found where the connection between the two diseases is marked. Laveran does not believe that diabetes is due to malaria. He says there is not sufficient evidence, and that what evidence there is does not support the theory. I have come across one case where amyloid degeneration of the liver, spleen, and kidney was supposed to be due to chronic malaria; but except for the existence of chills and that the man had been in Tunis, where malaria prevails, there seems to be no logical connection between the pathological findings and the history of the patient before death. Amyloid disease has often been attributed to malaria (chronic), especially by writers before the discovery of the malarial parasite, but I believe no evidence exists which proves that malaria of any type ever produces this affection. Pope[8] says anasarca is common in cases of chronic malaria, though it may occur in other types of malarial fever. But he gives no cases and mentions no examinations of the blood. Dropsy, general or partial, I have noted above as mentioned by an

[1] L. F. Barker: Johns Hopkins Hospital Reports, 1895, v.
[2] Manson: British Medical Journal, 1896.
[3] Stewart: British Medical Journal, April 11, 1896.
[4] D. Pace: Gior. internaz. de. sc. med. Napoli, 1894, n. s., xvi.
[5] F. Chvostek: "Ueber das Wesen Paroxysmalen Hæmoglobinurie," Leipzig, 1894.
[6] Kelsch and Kiener: Traité des Maladies des Pays chauds, Paris, 1894.
[7] E. Mossé: Gaz. hebd. de sc. Méd. de Montpellier, 1888, x.
[8] G. I. Pope: American Practitioner and News, Louisville, 1887, n. s. iii.

American author writing from Virginia. In cases of malaria which have existed for some time, and where the anæmia is well marked, it is not uncommon to find slight œdema about the ankles, but general anasarca is rare. I would here refer to three cases which I had the opportunity of observing a year ago in the Dispensary of the Emergency Hospital of this city, and I take pleasure here in thanking Dr. George Byrd Harrison, of Washington, for permission to publish these cases.

The first is that of a man, aged forty-three years; white. He came to the hospital complaining of swollen feet. His past history was negative; had never had chills before present illness, nor did he remember ever having been ill before.

Present history. October 22, 1895. Two weeks ago his chills stopped, under use of quinine. He had had ten chills previously on consecutive days; after chills had some fever; was thirsty and felt weak. Did not notice about headaches. Had pains in his bones. Did not vomit. Since last chill has felt well. Three nights ago (October 19th) noticed feet were swollen about ankles; next day more so, and yesterday could not get shoes on. His general condition seems good, except that he has had two or three loose stools for the past ten days. There is puffiness about the eyes, and he looks like a man suffering from Bright's disease. Pulse is full and regular, tension not increased. He is anæmic and has a pasty look. Tongue dry, with slight brownish coat. No history of exposure to wet or cold; feet have not been wet. He is a trunk-maker. No blue line on gums. Feet and legs much swollen, pitting on pressure along whole length of tibiæ. Says urine has not been increased, but looks reddish at times. Urine passed when patient was seen was entirely negative. Blood showed many crescents (æstivo-autumnal malaria). The patient was sent to the hospital and soon recovered on rest and tonics (ext. iron and quinine).

The second case, which I will not report in full, is essentially similar in every respect. The man had marked œdema of the legs, and could not get his boots on. The urine was negative. His blood showed crescents and preflaggelating forms of malarial organisms.

The third case occurred in a mulatto girl, and in no wise differs from the two related. The urine was negative, and her blood showed crescents.

Only in the first case is the whole history satisfactory; no other cause for condition could be found. In the second the man disappeared from view and no physical examination was made. In the third no physical examination was made, but the patient improved rapidly when put on quinine regularly.

I am, however, inclined to attribute the anasarca in all three cases to the malaria alone, and that of the æstivo-autumnal variety, although it must be admitted that factors other than malaria, though not recognized, may have played a part. A point of some interest here is that the anæmia seems to be greatest in the tertian variety of malaria, since the destruction of the red blood-cells in this form is more rapid and extensive than in the ordinary attacks of æstivo-autumnal fever. The degree of anæmia in these cases from ocular evidence alone—which, however,

is often delusive—was not marked, and unfortunately no blood-count was made in any of the three cases. How to explain the anasarca in them is not very clear. In the first two cases the feet were so swollen that the patients could not get on their boots, but wore large, loose slippers; in the third case the girl could not button her boots over her instep. In this connection, however, I would call attention to the case reported by Barker: "Case D.—Double tertian malarial infection, associated with general streptococcus infection; symptoms of an acute nephritis with general anasarca manifested during life." Although this case does not accurately correspond with those given above, yet it is possible that in the three patients whose history I have related there may have been a mild streptococcus invasion; a single examination of the urine is not sufficient to prove that the kidneys were in an absolutely normal condition. It is this possibility which calls for the remark made above in reference to these cases, that factors other than malaria, though not recognized (and possibly not recognizable) may have played a part. It is unnecessary to give Barker's case in detail. One of the interesting points in it is that by accident the blood was not examined during life, and the condition of hemorrhagic nephritis was, therefore, not attributed to malaria. It was only at autopsy that the true cause for the trouble was discovered. In his case the anasarca may justly be attributed to the streptococcus infection, whereas in the three cases reported by myself there must remain a doubt as to the cause of the anasarca. Barker says "the bacterial infections which may be associated with malaria are numerous," but that "cases of general streptococcus infection, such as the one described under the head of Case D, are undoubtedly rare."

The eye-symptoms in malaria have been much observed, and there are several long papers descriptive of these, but there is little confirmatory evidence of the various affections described as being due to malaria. We have papers by De Schweinitz,[1] Sulzer,[2] Sacchi,[3] Hewelke,[4] Seljouk,[5] and Hall.[6] De Schweinitz reviews the literature and gives a long list of ocular complications; in only one case mentioned by him—a case of bilateral hemianopia—were organisms found. The other authors, with the exception of Sulzer, report one case each of ocular trouble supposedly due to malaria—one of functional blindness, one of iritis plastica, one of mydriasis, and one of hypersensitiveness of the optic nerve. Sulzer, who had wide and favorable opportunity for studying the eye-symptoms in a number of soldiers in Borneo, reports no cases where malarial organisms were found in the blood at the time the eye-

[1] De Schweinitz: Medical News, Philadelphia, 1890, lvi.
[2] Sulzer: Archiv. d'Ophth., Paris, 1890, x.
[3] E. Sacchi: Gaz. d. osp., Milano, 1887, viii.
[4] O. Hewelke: Kron. lek. Warszawa, 1889, x.
[5] I. Seljouk: Russk. Med., St. Petersburgh, 1889, vii.
[6] W. T. Hall: Peoria M. Month, 1888-89, ix.

symptoms existed. He mentions the following conditions as occurring and due to malaria:

Intermittent amaurosis,	Sudden and persistent blindness,	Retino-choroiditis,
Optic neuritis,	Periodic blue vision,	Purulent choroiditis,
Perineuritis,	Scotoma,	
Atrophy of optic nerve,	Retinal hemorrhages,	Photophobia.

He classifies the conditions as follows:

1. Chronic optic neuritis with melanosis of papilla in severe forms.
2. Diffuse infiltration of vitreous body.
3. Multiple peripheral punctiform hemorrhages of the retina.
4. Sudden and persistent amaurosis.

These are the severe forms, and a second class of less severe types are as follows:

1. Amaurosis and periodic amblyopia without ocular lesions.
2. Diffuse lesions of the fundus of the eye which predispose to macular affections.
3. Large peripapillary and macular retinal hemorrhages.

He says there is a certain distinct color of the retina which is diagnostic of malaria; this is a reddish-gray or even black ("une teinte rouge grisâtre et même noirâtre"). This coloration is due to the presence of pigmented leucocytes in the enlarged capillary vessels of the papilla—that is to say, to a true melanosis of the organ. Such a condition is conceivable, as we know by proof that the cerebral capillaries may contain pigmented leucocytes and malarial organisms; but the actual proof is wanting in this case, and so the whole matter stands. These eye-symptoms are certainly most interesting, but require further study for their elucidation. Laveran says amblyopia may be due to capillary emboli of pigment-bearing leucocytes.

Much has been written about malaria as a causative factor in pneumonia, but there is not a single case on record which stands proof. Marchiafava and Guarnieri[1] report a case, with autopsy, where the two diseases existed at the same time; but at the autopsy the diplococci pneumoniæ were found in the lung, and the part played by the malaria was possibly simply that of weakening the constitution of the patients. Martin[2] reports another case with autopsy—not quite so conclusive, for there was no bacteriological examination, but there were no signs that the pneumonia was in any way affected by the malaria. Cerri,[3] in a short article on this subject in which he gives no cases, concludes that a

[1] Marchiafava and Guarnieri: Bull. d. r. acad. med. di Roma, 1888-89, x.
[2] Martin: Montreal Medical Journal, 1892-93, xxi.
[3] V. Cerri: Gazz. d. osp., Milano, 1895, xvi.

pneumonia that is neither frank in its onset, course, nor symptomatology, may be due to malaria; that it runs its course in four or five days, presenting an aggravation on the third; that it has an adynamic character; that quinine is an excellent remedy and shortens the course of the disease. And he believes it due to malaria because of its abnormal course, because it sets in after the malarial fever has begun, and because of the efficiency of quinine. In reply, all that need be said is that the best observers, Laveran, Marchiafava, Osler, Howard,[1] etc., do not agree with him. On the subject of the association of malaria and pneumonia, Laveran says that the pneumonia in those suffering from the cachexia resulting from malaria, or simply in anæmic patients weakened by one or more attacks of intermittent fever, may not be *franc*, but may rather resemble the form seen in old people. It may be prolonged and the resolution very slow. He says "there is no such thing as a malarial intermittent pneumonia, nor a remittent pneumonic fever, nor a pernicious pneumonic fever. That where there would seem to be a malarial intermittent pneumonia it is only due to pulmonary congestion observed at each attack of the intermittent fever." Of the association of malaria with bronchitis and broncho-pneumonia, little need be said. "They are frequent complications of malaria, and probably may be due to any of the pyogenic organisms" (Barker). That they are such common complications is not to be wondered at when we know of the unhygienic lives led by many of those suffering with malaria; how a large number of our dispensary patients sleep out-of-doors in malarial localities, and are exposed to damp and wet. Tuberculosis and malaria may be associated, as in a case reported by Leidy,[2] but although Anders (*loc. cit.*) believes malaria predisposes to this disease, there is no evidence of such being the case, and there is still less evidence that pleurisy may be due to malaria.

In close association with the lung symptoms come those associated with the heart. Many authors believe that malaria may cause definite heart lesions, but again there is not a single case reported which is of convincing evidence, and as negative proof against this theory Laveran and the other authorities on malaria hold the opposite view. Laveran says that in all the patients with malaria whom he examined, he never saw the signs of a pericarditis nor an endocarditis; only once at an autopsy did he find the signs of an old endocarditis. Toralbo,[3] in an article dealing with this subject (he gives no cases), mentions the four following conditions as dependent on malaria:

[1] It is interesting to note that Howard's work was written in 1859, and had, as Barker says, "an important influence, and still merits careful reading." When we consider that it was written without any of that light which the investigators of the past ten years have thrown on this subject, the conclusions he came to are remarkable and show wonderfully careful observation on the part of the author.

[2] J. Leidy, Jr.: Transactions of the Pathological Society of Philadelphia, 1890-91, xv.

[3] L. Toralbo: Osservatore, Torino, 1890, xii.

1. Dilatation of heart.
2. Atheromatous changes.
3. Mitral insufficiency.
4. Fatty degeneration of myocardium.

Sbrana (*loc. cit.*) reports a case of "myocardite palustre" in a man who had had intermittent fever and later developed a large heart; but the history of the case does not prove his conclusion that the cardiac lesion was dependent on the fever.

Law[1] believes definite heart disease to be due to malaria, where the proof is only that the patients have lived in a malarious country. Agreda,[2] Smith,[3] and Saussol[4] all report unsatisfactory cases, where the evidence does not even exist that the patient had malaria. Moscato[5] mentions a case of a man who had had neither rheumatism, acute or chronic, nor any infectious disease like typhoid, nor erysipelas, and who had not abused alcohol, tea, or tobacco. For about five months in the year before he was seen by the author he had had malaria; he now showed signs of mitral insufficiency, hypertrophy of heart, with œdema and albumin. His spleen was enlarged. No examination of blood. This is the most convincing case that I have found, but it is by no means sure that the heart lesion here was dependent on malaria. Rauzier[6] finds functional murmurs frequently in cases affected with malaria. They are usually systolic in time, and situated at the apex. He attributes them to the action of the poison on the muscles of the valves. We can readily believe in these functional murmurs, but would rather attribute them to the anæmia, which is such a marked symptom in malaria, as we attribute them to the same cause in chlorosis.

Sbrana (*loc. cit.*), Chastang,[7] Ragazzi,[8] and others all mention cases of phlebitis following malaria. The best of these is that reported by Ragazzi, though here again no examination of the blood was made. The patient was a male, aged twenty-three years. He had been sick in a hospital for seventy-seven days, with malaria (daily chills); then he left, cured. Phlebitis of right leg developed a week later. Certainly the long time which he was sick is against the man having had malaria; but if it was malaria it does not seem at all unlikely that a phlebitis might result as a consequence of the debilitated condition in which the patient would have been left. The other cases are less convincing than this one.

[1] Law: British Guiana Med. Ann., Demerara, 1892.
[2] F. Agreda: Rev. de med. y cirug. práct., Madrid, 1891, xxviii.
[3] A. H. Smith: New York Medical Record, 1885 and 1886.
[4] Saussol: Gaz. hebd. de sc. méd. de Montpel., 1886, viii.
[5] P. Moscato: Morgagni, Milano, 1895, xxxvii.
[6] G. Rauzier: Rev. de méd., Paris, 1890, x.
[7] Chastang: Archiv. de méd. nav., Paris, 1895, lxiii.
[8] G. Ragazzi: Gaz. med. lomb., Milano, 1894, lxiii.

In considering the vascular disturbances, it may be as well to add a word here on Raynaud's disease, which by some has been attributed to malaria. On this point Laveran says that he believed that the disease can only be indirectly due to malaria which augments the sensibility to cold and exaggerates the reflex action of the spinal cord on the vaso-motor system. Gangrene may be directly due to malaria, he says, as a result of thrombosis, but it is still an open question.

Intermittent swelling of the thyroid gland, intermittent torticollis, purpura hæmorrhagica, and angina, as well as other strange conditions, have been noted as being due to malaria, but it is not worth while to spend any time on them, as they are reported but very rarely, and the cases are not in any manner convincing.

I will now finally take up the two most interesting groups of conditions on which most has been written, and for which we have the best confirmatory evidence: first, the gastro-intestinal signs or symptoms, and, secondly and lastly, the nervous, including both the central and the peripheral nervous system.

Severe gastro-intestinal disturbances are common in the pernicious form of malarial fever, by which is meant that form where the æstivo-autumnal organisms are found in the blood. There is conclusive evidence to be found in the works and papers of Laveran (*loc. cit.*), Marchiafava, Bignami and Bastianelli, and others. On this point Laveran says he has seen and relates cases, giving the type of organism found in each, where the symptoms resembled typhoid fever, or where they were choleriform in character; others with gastralgia, or with bilious vomiting and jaundice, and, still more rare, a few cases with diaphoretic and convulsive symptoms or with bilious fever and hæmaturia. Marchiafava and Bignami[1] report cases with choleriform symptoms. Profuse diarrhœa, vomiting, aphonia, and all the signs of an acute intestinal catarrh have been noted by Bignami and Bastianelli.[2] In autopsies they have found the mucosa of stomach and intestine swollen, intensely hyperæmic, œdematous, and covered with scattered punctiform hemorrhages of a red-brown color, and with the vessels thrombosed and full of organisms. There existed small superficial necroses and a secondary pericellular infiltration. Laveran in one case of pernicious fever found the peritoneum studded with minute hemorrhages. Marchiafava,[3] in an interesting paper, says that among the pernicious fevers of the æstivo-autumnal variety of the Roman campagna there is a gastro-intestinal type, where the parasites accumulate in the capillaries of the mucous membrane of the intestine, and that the symptoms produced are like

[1] Marchiafava and Bignami: Bull. d. r. acad. Med. di Roma, 1892, xviii.

[2] Bignami and Bastianelli: Lavori del., III. Cong. del. Soc. Mal. di med. intern., Roma, 1890.

[3] Marchiafava: Atti di XI. Cong. med. internaz., Roma, 1894, ii.

those of cholera: vomiting, abdominal pain, frequent and copious diarrhœa, cyanosis, aphonia, coldness, and singultus. In the diarrhœa, which contains blood, the parasite may be found. He says that the cases may be mistaken for cholera, and that in case of death the diagnosis is to be made from the pathological findings, which are dependent on the presence of the organisms and the color of the mucous membrane caused by them.

Of the above conditions there can be no rational doubt, since the cases are reported by authorities, and in all the blood examination has proved the existence of malaria.[1] There has been much discussion in the past on the so-called typho-malarial fevers. As above described there may be cases of malaria with typhoidal symptoms, and true typhoid, though rarely, may occur coincidently with malaria, but there is no other form of fever which justifies the name typho-malarial. The fever is either malaria or typhoid, or typhoid with malaria, or neither. But there is no halfway form where the former may turn into the latter, or *vice versa*, and the term and all ideas associated with it should be entirely discarded, since all or any proof is wanting of its existence. Garnier,[2] in a long thesis, where the cases are reported without examination of the blood, gives an account of the gastro-intestinal symptoms of malaria. His cases are not convincing, and may some of them have been dysentery—ordinary or of amœbic origin—and others may have been typhoid. Amœbic dysentery may be associated with malaria in just the same way as typhoid, as is typified by one case reported by Thayer and Hewetson. Barker says, "concerning protozoan infections concurrent with malaria little is known." Lardier[3] reports cases of intermittent diarrhœa after gestation, which he attributes, without sufficient proof, to malaria. Reyes,[4] likewise, without confirmatory evidence in the blood, gives account of several cases where the most prominent symptom was a pseudo-intestinal occlusion. He calls them, and fairly so, "rare" cases of pernicious fever. Pensuti[5] describes a case of primary atrophy of the mucous membrane of the intestine. The patient was in the hospital for nearly three months, and suffered much from vomiting and diarrhœa. The spleen was not enlarged, the blood was not examined, and quinine had no effect on the course of disease. At autopsy the atrophy was most marked about the ileo-cæcal valve. He attributes the condition to malaria, but it would seem reasonable to doubt it. The intestinal symptoms of malaria in pernicious fevers are well marked, and

[1] An interesting case (Case B), with "grave abdominal symptoms," is to be found in Barker's paper; it occurred in Dr. Osler's clinic. It is also reported as one of the fatal pernicious cases in Thayer and Hewetson's treatise.

[2] J. A. V. A. Garnier: Thèse, Bordeaux, 1888.

[3] Lardier: Gaz. hebd. de sc. méd. de Montpel., 1888, ii.

[4] A. W. Reyes: Cron. Med. quir. de la Habana, 1888, xiv.

[5] V. Pensuti: Gaz. med. di Roma, 1893, xix.

with necessary study and precaution are readily to be differentiated from those caused by other diseases.

Although I do not mean to take up the pathological findings in cases of malaria in detail, yet something must be said here on the question of cirrhosis as due to this disease. Much has been written on this point, and the best review of the present knowledge of this condition is to be found in Barker's article, from which I shall quote directly. He says: "Even in the early descriptions of malaria the important influence of the disease as a causative factor in the production of chronic interstitial inflammations of some of the internal organs, and especially of the liver and kidneys, is mentioned. . . . On the other hand, by not a few authors, the possibility of cirrhotic processes being due to malaria has been stoutly denied. It has been justly claimed that in many of the cases reported as instances of chronic inflammation due to malaria insufficient attention has been paid to the possible responsibility of other etiological factors, such as alcoholism, syphilis, and tuberculosis. Dr. Osler has particularly pointed out the difficulty of saying, in a given case of cirrhosis of the liver or kidneys, that malaria has been the cause, and in his experience the association of malaria with cirrhosis has been very uncommon. Dr. Welch has seen only one case of malarial cirrhosis of the liver in New York, and that was in an Algerian. The foregoing study has, however, convinced me that there are conditions present in malaria which are generally recognized as being capable of giving rise to chronic fibroid processes, and it would be strange did the latter not occur more or less frequently. Bignami, in a very careful study of chronic malarial cases in Italy, has come to a similar conclusion, and traces with much acumen the chain of events from the onset of an acute malarial infection to the development of a cirrhotic process. A careful consideration of the various phenomena associated with acute malaria will show that there are many ways in which a chronic intestinal inflammation could arise. Thus, looking upon the chronic interstitial inflammations as being due most often to a primary degeneration of certain of the tissue elements, the new growth of fibrous tissues being secondary, we can think of many possible causes of the former. Thus, the profound changes in the character of the blood-serum consequent upon the alteration and destruction of large numbers of red corpuscles and leucocytes, the intermittent hyperæmia in the viscera, the setting free of the malarial pigment, and the accumulation of the latter in the cells and tissues, the multiple capillary thromboses which sometimes occur, the disturbances of digestion in many of the cases, the areas of necrotic cells which can be demonstrated in liver, spleen, and kidneys; these are sufficient to convince one of the existence of many possible injurious influences." Barker then proceeds to elaborate these different causes, and from his careful study there is no other conclusion to be

drawn than that malaria may produce cirrhotic alterations in the internal organs in some cases, not always, but in a sufficient number to leave no doubt that the cause and effect are here intimately connected.

In conclusion, I will briefly describe the nervous symptoms, for which we have as good proof as for the gastro-intestinal, proof dependent not on ideas alone, but on facts corroborated by examinations of the blood, and reported by trustworthy observers.

Marchiafava and Bignami classify a number of pernicious cases as follows:

1. Those with cerebral and bulbar symptoms.
2. Those with irritative cerebral symptoms (like meningitis).
3. Those with eclamptic symptoms.
4. Those with hemiplegic symptoms.
5. Those with hemorrhagic symptoms.
6. Those with choleriform symptoms.
7. Those with comatose and soporose symptoms.
8. Those with delirium.

Laveran has also noted cases with sopor, coma, and delirium, and others with oppression and dyspnœa not apparently due to any lesion of the respiratory organs. He says "an apoplectic form has been described; there is no example, I believe, in which an individual healthy up to the time when he is attacked, falls suddenly into a state of coma due to malaria, like an individual attacked with cerebral hemorrhage; almost always the comatose attack is preceded by simpler attacks, and the attacks which are to develop into coma always begin as simple attacks; the temperature goes up with or without an initial chill, there is headache, general malaise, etc." Marchiafava, in speaking of the pernicious forms of the Roman campagna, says that the cerebral forms prevail—that is, those with soporose and comatose symptoms; then in order given those with delirium, with bulbar, convulsive, hemiplegic, and tetanic symptoms. Sacchi has a long article on the paralyses following or due to malaria; but his cases are not confirmed by blood examinations. He classifies them into three sorts:

1. Those coming on during ordinary intermittent fever.
2. Those following pernicious attacks.
3. Those resulting from chronic malaria.

He says they may take various types: aphasia, hemiplegia, paraplegia, partial anæsthesia, and disturbances of vision, of hearing, and of the other sensory organs. He attributes them to pigmented capillary emboli. Undoubtedly all these signs may occur, but it is very questionable whether they are ever seen in his first class of cases—*i. e.*, those of ordinary intermittent fever. It is more difficult to speak definitely as to the possibility of such conditions resulting from chronic malaria, but it seems highly unlikely that they should. Bastianelli and Bignami have noted

disturbances in innervation of the pupils in many cases, the right being larger than the left, or *vice versa*. Changes may occur during the day or night. Also that there is diminution, either bilateral or unilateral, in the innervation of the facial nerve, and the tonus of this nerve is very commonly lessened. They think that the irritative are more common than the paralytic symptoms, and have frequently observed excessive hyperæsthesia of the muscles. They report a case with bulbar symptoms, where the malarial organisms were found in the blood, and where the signs all disappeared under treatment with quinine. In an autopsy they found hemorrhages containing the organisms, in the white substance of both hemispheres and of the medulla oblongata, and also thrombosed cerebral vessels. Marchiafava[1] reports a case, with autopsy, of pernicious malarial fever, which during life had presented bulbar symptoms.

There were degenerative changes found in the cells of the medulla oblongata, due to stasis and thromboses of the capillary vessels, in which were found the organisms.

Torti[2] reports two very interesting cases where there were symptoms of multiple sclerosis. Both were cured by quinine, and in neither case was there evidence of any other disease like syphilis, nor had there been any abuse of alcohol or tobacco. Hysteria may very closely simulate multiple sclerosis, and it would in this way be possible to explain these two cases as being hysterical in nature. Not that they did not have malaria—for the blood examination proved that conclusively—but that the patients, being possibly of a nervous temperament, exhibited the effects of their disease in this strange form. Bonami[3] has noted hemiplegia, convulsions, and transitory aphasia in cases attributed by him to malaria, of which the evidence is insufficient. Santo-Souza[4] relates a case of some importance, however without any blood examination. The case was of a man, aged twenty-five years, who apparently had severe malarial fever; in his second attack he had persistent paraplegia with paresis of the upper limbs. The spleen was enlarged, and the patient had high fever. He died, but there was no autopsy.

Moscato[5] has a long article on the multiple localizations of malaria on the central nervous system; sixty-four cases are badly reported, and furnish insufficient evidence for his theories. He gives a long list with the greatest variety of mental symptoms; in fact, there is hardly a possible brain symptom omitted. Though there may be much truth in his ideas, as we know from the more exact cases reported by others, yet he

[1] Marchiafava: Lavori del III. Cong. del. soc. ital. di med. intern., Roma, 1890.
[2] A. Torti: Riforma med. Napoli, 1891, xii.
[3] E. Bonami: Journal de med. de l'ouest, Nantes, 1887.
[4] J. L. de Santo-Souza: Gaz. med. da Bahia, 1890-91, 4 S., i.
[5] P. Moscato: Morgagni, Milano, 1890, xxxii.

carries his theories too far to be reasonable. Wolfe,[1] Norwine,[2] Oxford,[3] Holt,[4] Morini,[5] and Hurd[6] individually give cases of apoplexy and insanity, chorea, trismus, malaria simulating meningitis, and an epileptic attack with aphasia and paralysis of right facial nerve, and various paralyses. None of them show that malaria was the actual cause.

Combemale[7] thinks there is no doubt that neuritis may be due to malaria, although Laveran, Weir Mitchell, and others do not believe in it. But he does, on the analogy of its causing such a variety of cerebral symptoms. He gives one case to confirm his theory, which is worse than if he had reported none. An officer who had been in Africa in 1865, and had had chills off and on for ten years, developed polyneuritis in 1890. He had had no chills since 1876. The blood was not examined, and quinine made him worse.

Jourdan[8] also reports a case of peripheral neuritis, which he attributes to malaria; but again there is not sufficient proof to make it at all certain. Teissier[9] reports two cases where the nervous symptoms came on a long time after the patients had had malaria; they add no weight to the theory that malaria may cause such conditions. Of neuralgia Laveran says that in those cases which he had observed, the pains had almost always existed previously to the chills, and thinks when the pains occurred in conjunction with malaria, that they were due to the associated anæmia. He says neuralgia may be intermittent, and cured by quinine without being due to malaria. Speaking of paralyses, he says they may be either transitory or persistent, the transitory being directly due to the malaria, coming on with the attacks and cured by quinine. The persistent paralyses are more common than the transitory, but their etiological relation to malaria is less clear and in many cases more difficult to determine; hemiplegia is the most common form. He saw only two cases, and was not convinced that they were due to malaria; one patient had had syphilis. They may be due to thromboses, which do not clear up, and which cause softening, while the transitory form may be a result of small hemorrhages.

In making a short review of what has gone before, there are several deductions which can be drawn: first and foremost, that malaria is not the cause of so many evils as are attributed to it; secondly, that its favorite seats of attack after the blood and blood-making organs are the

[1] S. Wolfe: Medical and Surgical Reporter, Philadelphia, 1888, lix.
[2] J. J. Norwine: Therapeutic Gazette, Detroit, 1885, 3 S. ii.
[3] E. Oxford: Gac. Med. de Caracas. Ann., 3 No., xi.
[4] L. E. Holt: Archives of Pediatrics, Philadelphia, 1887, iv.
[5] D. Morini: Raccoglitore med. Forti., 1891, 5 S. xi.
[6] A. W. Hurd: Buffalo Medical and Surgical Journal, 1888-89, xxviii.
[7] Combemale: Progrès Médical, Paris, 1893, 2 S. xvi.
[8] Jourdan: Archives de médecine et de pharmacie militaire, Paris, 1896.
[9] Teissier: Bill. méd., Paris, 1894.

gastro-intestinal and the central nervous systems, and that other organs or systems are but rarely affected; thirdly, and not least important, that the cases supposed to be malaria should in the future be more carefully studied, and that hereafter it should not be given as a cause of existing evils without sufficient and abundant proof. If the blood cannot be examined then only a full history of the case should be accepted in which the fever, spleen, and effects of treatment are carefully noted.

I will close by a brief quotation from Laveran's work; he says: "This great frequency of accidents occurring in malaria has been much exaggerated; some observers have come to attribute numberless complications to it, and in the diseases of the warm countries see, so to speak, only various types of malaria. Authors have described an ophthalmia, a urethritis, a rheumatism, all due to malaria. . . . All diseases may be associated with malaria; the condition of anæmia and the feebleness which it rapidly brings about cause of themselves a true predisposition for certain affections like pneumonia and dysentery. . . . The error of those who attribute to malaria all the maladies which may complicate it, or even the greater number of those which have been observed in malarious countries, is certainly not small." This is as true now as when written in 1884, and does not speak well for the profession at large. The mistakes occur in all countries, but it is time their number was growing less rather than more.

ORIGINAL STUDIES IN THE BACTERIOLOGY OF CHRONIC ENDOMETRITIS.

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Before entering upon the study of the bacteriology of the uterine cavity it is important first to consider the bacteria of the vaginal tract. Kaltenbach has claimed that pathogenic micro-organisms are constantly present in the vaginas of pregnant women. Steffeck and Winter found in the vaginal secretions of pregnant women, even when they had not been examined for a long time, numerous varieties of bacteria, among which were pyogenic streptococci, staphylococci, and diplococci.

Ahlfeld claimed that the vagina of every woman contains bacteria which, under favorable circumstances, can be the cause of fever or, indeed, death.

Döderlin differentiated between normal and pathological vaginal secretion. The normal secretion, he claimed, gives a strongly acid reaction; the pathological secretion is feebly acid, neutral, or even alkaline. Bacteriological examination showed in the normal secretion

almost exclusively a single variety of bacillus, which he has designated by the special name of bacillus vaginæ; while in the pathological secretion he found the greatest variety of organisms, including both cocci and bacilli. He found streptococci in 4.9 per cent. of these cases. He introduced into the vagina of a virgin, which normally contained the bacillus vaginæ in pure culture, pure cultures of the staphylococcus aureus. After four days all of the staphylococci had disappeared.

Krönig (*Deutsche med. Wochenschrift*, No. 43, 1894) has found that if nothing is introduced into the normal human vagina for two or three days, it undergoes spontaneous sterilization of all germs except the vaginal bacillus of Döderlin. He introduced pure cultures of the bacillus pyocyaneus into the vagina in twenty cases, and found that they had entirely disappeared in from fourteen to thirty hours.

The experiments of Menge (*Deutsche med. Wochenschrift*, No. 46, 1894) show the same bactericidal property of vaginal secretion. He found that staphylococci and streptococci were killed in from two and one-half to seventy hours, irrespective of the reaction of the secretion.

Although the results of these experiments are at variance, the observations of Döderlin, Krönig, and Menge have been made with such care and with the advantage of the more recent methods of research, and involve such a large number of cases, that we may assume that they demonstrate the real condition of things. We may assume that the healthy vagina has the power of destroying the ordinary pathogenic bacteria, that when organisms are introduced from without they perish in a few hours or days, and that the only organism capable of withstanding the bactericidal action of the vagina is the benign bacillus vaginæ of Döderlin. As an exception, may be mentioned the gonococcus of Neisser, which is capable of multiplying in the presence of vaginal secretion; and certain other less common organisms which do not enter into the etiology of the ordinary chronic endometritis.

In the uterine canal other conditions are encountered, the chief of which are a difference in the chemical reaction of the secretions and a difference in the anatomical structure of the mucosa. But few reports of studies of the bacteria of the uterine cavity are to be found in literature, and those, unfortunately, show very variable results.

In 1887 and 1888 Laplace (American Journal of the Medical Sciences, 1892, vol. civ. p. 438) examined in Koch's laboratory the scrapings from the uteri of six healthy women. These scrapings were obtained by means of the platinum loop. All of the scrapings showed the presence of bacteria, the most common of which were the streptococci of suppuration. There were three varieties that could not be identified. Two of these, when injected into guinea-pigs, caused the death of the animal; the third was a harmless organism.

In cases of endocervicitis he found organisms to be very abundant;

and he identified streptococcus pyogenes, staphylococcus pyogenes aureus, albus, and citreus; a few of the bacillus pyocyaneus, and also many of the three above-mentioned unidentified varieties. He assumed that these organisms are constantly present, but that when the mucous membrane becomes inflamed they exist in much larger numbers. Finally he examined the scrapings from the uteri in six cases of chronic endometritis in the clinic of Prof. Martin, and found in all cases streptococci lodged in the depth of the tissues. He then proceeded to make the following deductions:

1. The normal endometrium of the uterus and cervix is a harbor for vast numbers of micro-organisms, most of which are known to us, but some still unknown yet possessing poisonous qualities for guinea-pigs.

2. The inflamed endometrium contains the same kinds of micro-organisms, but in vaster quantities, the superficial exfoliating cells also containing them.

3. In chronic endometritis the secretions contain about as many infectious organisms, the mucous membrane and fibrous tissue become greatly hypertrophied under the constant development of these organisms, and whether this chronic condition be simple or gonorrhœal, we find the germs both in the epithelial and fibrous tissue.

Contrast this with the more recent experiments of Menge, made in the Gynecological Clinic in Leipsic (*Deutsche med. Wochenschrift*, No. 48, 1894). In the cases of six women he introduced under strict precautions pure cultures of streptococci into the cervical canal. Microscopic examinations showed that the same changes took place as occurred in similar experiments in the vagina, namely, leucocytosis and phagocytosis. In an average of twelve hours all of the staphylococci had been destroyed. He believes that, with the exception of the gonococcus, bacteria cannot vegetate for any considerable length of time in the uterine canal.

To these observations I would add a series of studies which I have made in cases of chronic hypertrophic endometritis occurring in the service of Dr. L. S. Pilcher in the Seney Methodist Hospital in Brooklyn. The technique of my experiments was as follows: The patients were given daily vaginal douches for several days before the operation of curettement. After the patient had been anæsthetized, the vagina was scrubbed out with a gauze sponge smeared with soft-soap, while a constant irrigation of the vagina with boro-salicylic solution was kept up. The patient then being placed in the dorsal position, the vagina was dilated with retractors, the cervix drawn down with the tenaculum, and the external os wiped dry with a bit of sterilized gauze. The uterine canal was then dilated with the instruments of Ellinger and Goodell, and into its cavity was introduced a urethral endoscope of Grünfeldt. This is an instrument composed of a metallic tube fitted with a plunger

which completely occludes its calibre, and which projects slightly beyond the end of the tube, the ends of both being smoothly rounded. This instrument was passed to the fundus of the uterus, and the piston withdrawn. A small, sharp curette was then passed up through the tube to the fundus, and a bit of the mucosa scraped away. This bit of tissue, with some blood and mucus, was introduced into a tube of warm beef-bouillon-gelatin, slightly agitated to distribute the material, and either poured into a Petri dish or made into an Esmarch roll. All of the instruments used in the operation had been sterilized by boiling in soda solution. This procedure was carefully carried out in seventeen cases of chronic hypertrophic endometritis. Twelve of the plates gave no growth. Of the remaining five, one showed pure culture of staphylococcus pyogenes aureus in very large numbers; a second showed staphylococcus pyogenes aureus and an organism somewhat resembling proteus vulgaris; a third showed bacteria uræ; a fourth showed pure cultures of staphylococcus pyogenes albus, and a fifth showed the same germ as the fourth.

One of the most important facts in all these observations is that in no case was there a growth from the shreds or pieces of mucous membrane which lay embedded in the gelatin. In the cases in which there was a growth of bacterial colonies in the culture medium, the growth never showed any especial relation or connection to the implanted uterine tissue. This is one very strong reason for believing that these organisms do not bear an etiological relation to the chronic endometritis. Their absence in 71 per cent. of the cases is another strong evidence of their innocence. In order to account for their presence we must bear in mind that all of these cases had been subjected to repeated examinations and manipulations before and after admission to the hospital. The passage of the uterine sound might carry into the canal organisms which had been deposited in the mucus at the external os by the examining finger or other instrument. Or, indeed, such germs might have lain enveloped in the mucus at the os externum, protected by the chink in the torn cervix, for in all but one of these cases there was a laceration of the neck of the womb, and, not having been removed by the scrubbing and irrigation, have been carried up by the dilator or endoscope on its introduction. According to the investigations quoted above, the presence of such organisms would give no symptoms, for the reason that they were not only not proliferating, but were in process of extinction. It is a matter of much importance that the cervices and perinea which were repaired in these cases healed primarily, just as in the cases in which the bacterial findings were negative; nor was there any more post-operative rise of temperature.

The results of these observations are at variance with those of Laplace, who found virulent bacteria not only in the chronically inflamed uterus

but in the healthy uterus as well. If my experiments have been defective, the cause of such defect must be sought in the culture media employed. The removal of material for study was much more radical in my cases than in those of Laplace; and if the mucosa was infiltrated with bacteria, as is claimed by him, I certainly implanted them in my culture media. The question of error in the culture media may be eliminated, for the reason that in this same preparation of beef-peptone-bouillon-gelatin I have grown luxuriantly the pyogenic organisms which he claims to have found in the uterine canal.

Another reason arguing for the view that these virulent organisms are not present in chronic endometritis is that I am personally aware of three cases of perforation of the uterus by the sharp curette during the operation of curettage for this condition; and yet in not one of these cases did any sign of peritonitis, fever, or any other untoward symptom develop. In the Leipsic clinic twenty-eight myoma operations have been done by the modified method of Zweifel without any attempt to cleanse the cervical canal, and no bad results have been observed.

On the other hand, my observations are in harmony with those of Krönig and Menge. As a clinical fact, we know that under certain conditions the pyogenic streptococci and staphylococci may give rise to inflammatory processes in the female genital tract, but we know also that these inflammations are always of the acute type, and experimental research has demonstrated that these organisms are not capable of producing a non-febrile, slowly progressing, chronic inflammation. In many cases of chronic endometritis there has never been an acute inflammatory process, but the disease has come on gradually and insidiously. Although we have been able to find no micro-organism in the fully developed stage of the disease, yet we are in no position to declare that bacteria play no etiological *rôle*. We do know that after acute inflammations of the uterus and adnexa due to the gonococcus of Neisser, or to the organisms which produce the fever of the puerperal state, chronic inflammatory changes supervene; but whether some form of bacterial infection is necessary for the production of these changes is questionable, and, indeed, improbable.

From conclusions based upon the study of a large number of sections of uteri the seat of chronic endometritis, I am convinced that it is no more necessary to seek for a microbic origin in chronic endometritis than in chronic degeneration of any of the other glandular organs. The glandular portion of the uterus is made up of secreting epithelial cells resting upon a connective-tissue stroma, just as in the kidney, liver, or breast. Either one of these elements may become changed or increased through irritative or trophic disturbances without the presence of bacteria.

THE NECESSITY FOR PROMPT SURGICAL INTERFERENCE IN TYPHOID PERFORATION; ALSO IN TYPHOID FEVER COMPLICATED BY APPENDICITIS.[1]

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The hope of eliciting a discussion advantageous to both the surgeon and physician is my reason for presenting a short paper upon the important points in the diagnosis and treatment of typhoid perforation, and of appendicitis complicating typhoid fever, affections in which the necessity for prompt interference cannot be denied.

Perforation plays an important rôle in the mortality of typhoid fever; in eighty autopsies Osler found twenty cases of perforation. This condition may sometimes be overlooked, and a few cases undoubtedly recover without operation; but experience has shown that by early recognition of perforation and by prompt surgical interference the mortality of typhoid fever may be to a considerable degree lessened. Appendicitis sometimes occurs as a complication of typhoid fever, and is probably due to an extension of the inflammation from the ileum, attacking the solitary glands of the appendix; the structure, calibre, and lower vitality of the appendix render it much more vulnerable than the ileum to perforative ulceration. Appendicitis arising in connection with typhoid fever may jeopardize the life of the patient, if the appendix is not promptly removed. The presence of typhoid fever does not, in all instances, forbid operation for the removal of the appendix. To differentiate between perforative appendicitis and perforated typhoid ulcer is usually difficult, and at times even impossible.

The most important point in the diagnosis of typhoid perforation is the history. In the majority of cases the diagnosis of typhoid fever has previously been made, the exceptions being those cases of the walking variety, where the patient has not been under observation at all, or has been seen by the family physician only once or twice as an office patient. Under these circumstances, when the physician has not had the opportunity of studying the case sufficiently to enable him to make a diagnosis, and the patient becomes the subject of perforation, we can plainly see how difficult it would be to determine definitely the nature of the abdominal lesion. The case I report will illustrate this.

Perforation is most common at the end of the second or during the third week. In one of Osler's cases it occurred as early as the eighth day, and in another during the sixth week, two weeks after the evening temperature had become normal (Osler). Perforation may be associated with hemorrhage; but this is not the rule. The exciting

[1] Read before the College of Physicians, January 5, 1898.

cause of the perforation may be indiscretion in diet, vomiting, excessive tympany, and physical exertion. The location of the perforation is usually in the terminal twelve inches of the ileum. It may occur, however, in the colon. The onset of perforative symptoms is sudden; there are vomiting and severe abdominal pain, immediately followed by pronounced general rigidity of the belly-walls and general abdominal tenderness, followed by abdominal distention. Rigidity of the abdominal walls is, in my judgment, a most important and significant sign. In addition to these local signs there may be collapse, as evidenced by a sudden fall in the temperature even to the subnormal, rapid and small pulse, and pinched countenance. If there be general abdominal tenderness and tympanites before perforation occurs, the diagnosis is obscured.

The occurrence of sudden acute abdominal pain, with very decided general abdominal rigidity and tenderness, with or without collapse, is in a typhoid fever patient the strongest possible indication for immediate abdominal section. To wait after the advent of these symptoms for further corroborative evidence of perforation is fatal, for septic peritonitis, with a belly full of pus, will surely follow, thus not only adding to the difficulty of operation, but taking away from the patient the only chance for saving life. Why delay should be countenanced, in the light of the strong evidences of the approaching enemy, I cannot understand. It cannot be on the sole ground of objection to opening the belly of a typhoid fever patient. Even in the absence of a perforation an abdominal section could add but little additional danger. This is proven by the case of removal of the appendix in appendicitis complicating typhoid fever which I report, and which ran a typical course after the operation, the patient being bathed as usual, under the direction of my colleague, Dr. J. C. Wilson.

In the presence of symptoms of perforation it is not always conservative to defer opening the belly. Again, this naturally is not a question for the medical man alone to determine, but one in which the surgeon should be called in counsel. Aseptic surgery has enabled the surgeon to meet successfully many conditions heretofore regarded insurmountable, and I therefore urge my medical friends to divide with the surgeon the responsibility of these cases. I am sure that in this way the opportunity for doing good will be greatly increased. A sufficient number of cases of recovery following operation for perforated typhoid ulcer are now on record to lead to the rational conclusion that the patient subject to this most unfortunate condition had previously not been justly treated. Too often the cry is that the condition of the patient is not good enough for operation. Suppose the surgeon were content to allow this to influence him in the case of internal hemorrhage from other causes, how many lives would be daily sacrificed?

Fortunately, appendicitis occurring as a complication of typhoid

fever is not common. Appendicitis occurring in the presence of typhoid fever does not produce symptoms unlike those seen in the disease when it is present as an independent affection. As is usual, a history of a previous attack or attacks can be elicited. The sudden onset of pain referred to the epigastrium or umbilical region, nausea followed by vomiting, which ceases, as a rule, when the pain becomes localized in the right iliac fossa, the circumscribed tenderness which corresponds to the site of the appendix, and the circumscribed rigidity of the immediately overlying belly-walls will in the greater number of cases suffice to warrant the diagnosis of appendicitis. When appendicitis occurs in connection with typhoid fever the diagnosis cannot always be clear, because of the likelihood of perforation in the latter affection. Experience also teaches that typhoid fever is the cause of chronic appendicitis in a small percentage of cases. The following cases illustrate the statements advanced in the paper:

Appendicitis Complicating Typhoid Fever.—N. W., domestic, aged sixteen years, was admitted to the German Hospital May 3, 1897. A history of numerous attacks of colic during past years, often quite severe, was elicited. The patient had been engaged at her usual occupation up to within five days of her admission, when she was compelled to give up on account of indisposition. On the evening previous to her entrance into the hospital she was attacked by severe pain in the epigastric region, associated with vomiting. The pain soon became localized in the right iliac fossa, and was accompanied by circumscribed tenderness and rigidity, corresponding to the usual location of the appendix. Constipation was present. Pulse 100 and temperature 103° F. on the evening of the day of admission. A careful examination of the abdomen showed, in addition to the above-mentioned signs, slight tympany, decided enlargement of the spleen, and the presence of a few rose-colored spots. We were unable to elicit a history of the prodromal symptoms of typhoid fever, and therefore concluded, from the indisposition of the patient for five days before admission, the presence of the enlarged spleen, which was not tender to pressure, and the rose-colored spots, that the case was one of typhoid fever complicated by acute appendicitis. Unfortunately, the time was too limited to learn the results of the Widal test.

Operation for the removal of the appendix was advised. This was done on the evening of the day of admission. The usual incision was made. The intestines were distended; the ileum much congested; the appendix was found behind the cæcum, acutely inflamed in the terminal half, and contained pus where it was indurated. Appendix removed; wound closed. Light dressing applied and held in position by strips of adhesive plaster. The acute pain subsided directly after operation. Patient transferred to the medical wards under the care of Dr. J. C. Wilson, my colleague, where she received the bath-treatment. Recovery uneventful.

Typhoid Perforation.—D. F., aged twenty-seven years, admitted to the German Hospital November 7, 1897. Typhoid fever; perforative ulcer; free pus in abdomen.

Previous history: He had typhoid fever ten years ago, and so belongs to that rather rare class in which a second attack of typhoid occurs.

Present history: Ten days before patient was brought to hospital he complained of malaise. Had headache one week previous to admission. Bowels were rather constipated. Two nights previous to admission his temperature was 102° F. (only time that temperature was taken by him). On Saturday night (the night previous to admission to hospital) patient partook of a heavy meal. After eating dinner he attempted to see some patients, when he was suddenly taken with severe abdominal pain, necessitating his going to bed. For this pain he took sulphate of magnesia, applied hot-water bottles to the abdomen, and drank freely of warm drinks. Pain in abdomen was severe, requiring morphia. Sunday morning the entire abdomen was distended, very rigid, and exquisitely tender, especially over lower right quadrant. I was called in consultation by his attending physician, Dr. Eckman. After the examination we were convinced that there was a serious intra-abdominal lesion, probably slow leakage from a perforated typhoid ulcer, as indicated by the history and the condition. We were, however, by no means certain that it was not a perforated appendix. I advised operation, emphasizing the fact that delay would be dangerous. Operation revealed a belly full of pus, with free gas in the abdomen. The appendix was intensely congested, and was removed. No attempt was made to locate the perforation, on account of the difficulty experienced in dealing with the intestines, which were greatly distended, so that, notwithstanding the small incision and the use of gauze packing, etc., it was almost impossible to keep them in the belly-cavity. I therefore contented myself with thorough irrigation and drainage. The patient ran a typical course of typhoid of most severe type, complicated by several hemorrhages from bowel. He was transferred to my medical colleague, Dr. J. C. Wilson, and it gives me pleasure to report the patient's recovery. This case responded to the Widal test.

The pathological examination showed ulceration of the mucous membrane, submucous and muscular coats of the appendix.

The following occurred in the practice of Dr. H. C. Deaver:

Male, aged thirty-five years. Had run a typical course of typhoid fever. At the beginning of the third week he had a sudden sharp pain accompanied by rigidity of the abdominal muscles and followed in a short time by marked evidences of peritonitis. The inflammation of the peritoneum localized itself, and the patient slowly improved. Perforation had been diagnosticated, and operation advised and refused. At the end of ten days following the perforation the peritonitis again lit up and became general, the patient promptly dying.

Autopsy showed that there had been a localized peritonitis, with perforation and extravasation of feces at the site of one of Peyer's patches.

Male, aged thirty-six years. Had sudden onset of abdominal pain, accompanied by severe shock and marked rigidity of the abdominal walls, occurring in the third week of the disease. Diagnosis, perforation. Thirty-six hours later the patient was operated upon. The peritoneal cavity contained pus, and a pin-hole perforation was found in the ileum. Death. No autopsy.

Boy, aged nineteen years. Had perforation with typical symptoms occurring in fifth week of the disease. Refused operation. Patient died on the third day following the diagnosis of perforation. No autopsy.

REVIEWS.

PRACTICAL DIAGNOSIS: THE USE OF SYMPTOMS IN THE DIAGNOSIS OF DISEASE. Second edition. Revised and enlarged. By HOBART AMORY HARE, M.D., B.Sc. Illustrated with 201 engravings and 13 colored plates. Philadelphia and New York: Lea Brothers & Co., 1897.

NOT so very long ago a physician friend asked what was the best book on practical therapeutics. "I want a book," he said, "that is practical. When I have a case of colic to treat I want to turn in the index to 'colic' and find what to do for the case, without stopping to figure out the exact cause of the colic and without wading through a mass of physiological actions of drugs to see which one will suit the case." While cautioning him against indiscriminate prescribing after this machine fashion, we told him Hare's *Practical Therapeutics* would come as near to filling his need as any book with which we were acquainted. If any one in a similar frame of mind should inquire what book we could name that would help him to find quickly and with little effort what was the disease indicated by a particular symptom—*e. g.*, vomiting, colic, strabismus—we might reply, "Consult the copious index to Hare's *Practical Diagnosis*, and you will be referred to the page where light will be shed on the vexed question of the meaning of the symptom."

This work, rightly used, can be of great help; but it is rather to refresh one's memory, or to present known facts in a new light, than to furnish knowledge for the first time, that it is valuable. For instance, it has much that is of importance on the physical exploration of the chest; but it is not the book to place in the student's hands as a text-book on the physical diagnosis of diseases of the heart or lungs. And we do not believe the author ever intended it to be such.

The service done by this work is to call back some physicians, who are striving to make a diagnosis, from too close a consideration of the test-tube, the microscope, and the inoculated animal, to the pulse, the tongue, the fever, the mental state, the sounds of the heart, the color of the stools, the complaint of dizziness, the cough, etc. It aims to retain many of the heritages of our forefathers. The erudite touch that could detect the rise of temperature from the feel of the skin or the character of the pulse, and that located the abscess by the fine sense of fluctuation, or the change of contour, or the feeling of resistance, ought not to belong to a lost art. The thermometer, the microscope, the test-tube have made mere machines of too many already. And the Röntgen ray will have a tendency in the same direction. It is against this purely mechanical method of diagnosis by the aid of instruments and technique of precision that Hare has written. Not that he underestimates, in the least, the value of the exact instrumental methods. Far from it. But

he contends for the cultivation and employment of these older and natural methods, believing that even before the detection of tubercle bacilli in the sputum many cases of pulmonary tuberculosis were accurately diagnosticated, and that even before the day of Laveran and of Widal clear clinical distinctions were possible, in the majority of instances, between typhoid and malaria.

That Hare has touched a popular chord is shown by the early exhaustion of the first edition. Less than a year ago it was our pleasure to review the first edition in the pages of this JOURNAL.

The second edition has been enlarged by a few pages, and some ten new figures have been added. There has been shown a nice discrimination in the selection of figures and diagrams, of which there are two hundred. Each one is truly a help in diagnosis, teaching a lesson, oftentimes, as clearly as can be done in printed text.

This text, by the way, is generally clear and concise. At times it has seemed to us as though a careful revision, with more careful attempt at a systematic presentation of topics, would enhance the value of the book. We do not mean that the book is hastily written; but there is not that painstaking study of every paragraph and sentence that we see in some works, where one topic succeeds another in such natural, orderly sequence that we are amazed at the ease with which we read and understand, and only find the explanation when we come to analyze critically the make-up of the article, and find that the author has thoughtfully and studiously wrought out this order from a preceding chaos, that the strength and charm are the result of careful and arduous labor.

We are pleased to notice the popularity of Hare's work, and feel that it is destined to go through many subsequent editions, for it meets a popular demand and is a book that can be warmly recommended alike to student or practitioner. J. B. H.

DIE MIKROSKOPISCHE DIAGNOSTIK DER BÖSARTIGEN GESCHWÜLSTE. VON DR. DAVID HANSEMANN, Privatdocent an der Universität Berlin, und Prosector am Krankenhaus im Friedrichshain. Mit 83 Figuren im Text. Berlin: Verlag von August Hirschwald, 1897.

THE MICROSCOPICAL DIAGNOSIS OF MALIGNANT GROWTHS.

IN an introductory and eleven special chapters, Hansemann presents to the reader all that is worthy of note in connection with the important subject of the microscopical diagnosis of malignant growths. The author's style is most attractive and the subject-matter set forth in so fascinating a manner that the interest in the work never flags. Like Bunge's famous work on *Physiological Chemistry*, so might Hansemann's book be termed a scientific novel. The reasoning everywhere appears so strictly logical that the reader at first is inclined to agree to conclusions which, upon more careful consideration, he would, perhaps, not always indorse. In places the polemical spirit of the German becomes manifest, and the writer is perhaps more aggressive toward individuals than would be expected in a work of this character. These, however, are minor points, and, taken as a whole, Hansemann's exposition of the subject must certainly be regarded as truly classical.

In the first chapter the various attempts at a satisfactory classification of tumors in general are considered, and the principal difficulties in the way of such classification set forth, not the least being owing to our inability to find an appropriate definition for the term "tumor." The old saying of Virchow, that there is not a living being who could state, even under torture, just what a tumor is, still holds good at the present day. Regarded from a practical stand-point, a classification of tumors is only possible upon a morphological basis. According to Hansemann, a carcinoma is a tumor in which stroma and parenchyma can be distinctly separated the one from the other, while such a differentiation is less pronounced in the sarcomata, where the individual parenchymatous cells enter into an intimate connection with each other and the stroma, and at the same time form an intercellular substance. In both cases an extension of the growth beyond the normal boundaries of the invaded tissue occurs. In carcinoma and sarcoma, then, we can distinguish between parenchyma and stroma; but while in carcinoma this is usually possible at once, such a differentiation in the case of the sarcomata is rather more conceded on theoretical than on practical grounds. At the same time, however, it must be admitted that carcinomata occur in which the stroma is most imperfectly developed, while certain sarcomata, on the other hand, exhibit a most abundant growth in this respect. A sharp line of demarcation between the two kinds of tumors, hence, does not exist, and Hansemann, perhaps justly, suggests that it were better to do away with the terms carcinoma and sarcoma altogether. Unfortunately, however, other and more suitable terms cannot be substituted at the present time.

In the second chapter the morphology of malignant growths in relation to the mother-tissue is considered, and the nomenclature of the various forms of carcinoma and sarcoma presented in a most comprehensive manner. Very important is the dictum: "The parenchyma of a primary growth results from the parenchyma, the stroma from the stroma of the organ in which the tumor originates." The parenchymatous cells result from the mother-cells by a process of direct genesis or as a result of a metaplasia. The subject of metaplasia is then discussed in great detail. The writer recognizes the existence of two forms—viz., metaplasia proper, in the sense of simple variation, and anaplasia, where the character of the cells has undergone a complete change both morphologically and physiologically, so that entirely new species result. The subject of anaplasia plays a most important *rôle* in Hansemann's onkology, and is in reality its basis. The degree of anaplasia is measured by the extent to which the individual cells have deviated from the mother-cells; its highest grade is thus met with in the medullary carcinoma. Practically important is the observation that a carcinoma of slight anaplasia may, in the course of time, become highly anaplastic.

The third chapter is devoted to the karyokinetic changes occurring in malignant growths, and is without doubt one of the most interesting in the entire work. Asymmetric mitoses, although occurring quite constantly in carcinoma, cannot be considered as absolutely characteristic, as they are occasionally also observed in sarcomatous growths. It is important, however, to note that according to Hansemann they are never found under other conditions. He thus differs from Ströbe. As migratory degenerative chromosomes likewise only occur in carcinoma and sarcoma, it follows that hypochromatic cells are only encoun-

tered under these two conditions. Very important, furthermore, is Hansemann's observation that, while normally, as well as under other pathologic conditions, the character of the normal mitoses is constant for every particular cell-species, deviations occur in malignant growths. The degree of the deviation is directly proportionate to the degree of deviation of the tumor as a whole from the mother-tissue, the greatest variation being accordingly met with in medullary carcinoma, where at the same time a uniform character in the mitoses of the growth itself can no longer be recognized. But this in turn is really characteristic in itself. Only a positive result, however, is of value. From the fact that we do not observe a marked deviation, we are not entitled to the diagnosis "benign" growth, as the deviation may be so slight as not to be recognizable.

In the next chapter the degenerative processes which may occur in the parenchyma of malignant growths are carefully considered. Then follows a most excellent discussion of the relation existing between primary growths, metastases, and recurrences. The transplantation theory is regarded as an established fact. The metastases either show the same structure as the primary growth, or they exhibit a deviation of an anaplastic character. The same holds good for the recurrences.

The sixth chapter deals with the stroma of malignant growths, its origin, development, retrogressive metamorphoses, etc.

The important question, how to differentiate between metastases and primary growths, is admirably discussed in the seventh chapter. The function of tumor-cells is then considered, but, although the chapter is interesting in itself, it appears to be written rather more from the standpoint of the pathological anatomist than from that of the pathological physiologist. It is, perhaps, the least attractive section of the book. Hansemann denies that a malignant growth can result if a proliferating stimulus falls upon a normal cell. A hyperplasia, only, can occur under such conditions. A malignant growth will be the outcome if such a stimulus attacks an anaplastic cell. In this respect Hansemann materially differs from Ribbert, and becomes rather aggressive in the defence of his personal views.

Chapters nine, ten, and eleven, finally, which are devoted to the histogenesis of malignant growths, their etiology, and the significance of the microscopical examination as to diagnosis, respectively, are again excellent. The objections to Cohnheim's embryonic theory are ably discussed and maintained. Of the parasitic origin of the malignant growths he says the following: "At this place we neither wish to criticise nor describe things which, as we hope, already belong to history, and we merely wish to point out that degenerated cells, karyokinetic figures, secretion-products of the cells, white and red blood-corpuscles, their products of degeneration, and, finally, normal carcinomatous cells have been described as parasites," etc.

As we have already said, Hansemann's book is truly excellent, and certainly merits a translation into other languages. To the modern pathologist it is indispensable.

The illustrations are fairly good, and the typography of the work in conformity with the excellence maintained by its well-known publisher, August Hirschwald, of Berlin. C. E. S.

RINGWORM AND ALOPECIA AREATA: THEIR PATHOLOGY, DIAGNOSIS, AND TREATMENT. By H. ALDERSMITH, M.B. Lond., F.R.C.S. Fourth edition, enlarged and rewritten, with new illustrations. London: H. K. Lewis, 1897.

THIS is essentially a new book, and represents in clear, terse language our present knowledge of the cause, symptoms, and treatment of ringworm. The author adds the weight of his authority to the correctness, in the main, of the discoveries made by Sabouraud as to the plurality of the fungi causing this disease. It is now recognized that there are several fungi instead of one, as formerly believed, which are distinct botanically, morphologically, culturally, and clinically. These fungi—the author following Sabouraud—are divided into two classes—the small and the large spore-fungi; of the latter there are several varieties. The most common form of ringworm of the scalp is that due to the small spore-fungus—microsporon audouïni. This does not produce ringworm of the bearded region or of the nails, but small furfuraceous lesions are sometimes seen on the non-hairy parts. It is the most contagious type and, as a rule, the most rebellious to treatment. One variety of the large spore-fungus—the trichophyton megalosporon endothrix—is also met with on the scalp of children, and as a rare exception on the scalp of the adult; it does not invade the bearded parts or the nails, but sometimes produces transitory forms of body-ringworm, especially on the face and neck. The author cannot entirely agree with the general statement made by Sabouraud, that this type is not so rebellious. The other variety of the large spore-fungus—the trichophyton megalosporon ectothrix—is infrequent upon the scalp, but it is the fungus to which the common patches of body-ringworm, ringworm of the bearded region and of the nails are due. Sabouraud's statement is quoted that this variety is essentially an animal fungus, and is communicated to man from this source. It is the fungus usually found in pustular ringworm and in kerion.

Coming to the subject of treatment, it is learned that comparatively little progress has been made. The author's large field of observation in these cases has given full opportunity for the trial of the various vaunted new remedies, of which advantage has been taken; but the regret is expressed that the chronic types of the disease remain about as rebellious as formerly. It is remarked, as those of wide experience know, that there are cases, especially those of limited area and of short duration, which will respond to prompt and active application of various remedies. There remain, however, many cases which prove obstinate and rebellious to almost all methods. The writer believes the best general plan in these obstinate cases is to treat the disease with the remedial applications commonly employed, which will usually prevent its spread, and which will also usually bring the area of disease down to one or to a few well-defined patches; this being reached, he has recourse to treatment with croton oil. The author has also used the croton-oil method in single beginning areas, especially when for the educational interests of the child a rapid result was necessary. Particular directions are given as to the manner of its application, as it is a remedy which requires care and skill to bring about the favorable result without permanent damage to the skin. Formalin—a 40 per cent. solution of formaldehyde—the writer has also tried, and found it useful in some cases, but it is painful, and in his hands less certain and less successful than the croton-oil

method; it is, however, a safer remedy in the hands of the inexperienced.

Alopecia areata is discussed at less length than ringworm, and very properly so. Aldersmith is not a believer in its contagiousness, nor does he see any reason for considering it a parasitic disease. In the treatment, stimulation of the part is advised, with such remedies as iodine, cantharides, and the like, together with tonics, if necessary. The local treatment is considered the more important, and general treatment alone useless.

In conclusion, the reviewer takes pleasure in recommending this most excellent and comprehensive book, especially to those whose misfortune it is to have much to do with ringworm cases. H. W. S.

A TEXT-BOOK OF SPECIAL PATHOLOGICAL ANATOMY. By ERNST ZIEGLER, Professor of Pathology in the University of Freiburg. Translated and edited from the eighth German edition by DONALD MACALISTER, M.A., M.D., Linacre Lecturer of Physic and Tutor of St. John's College, Cambridge, and HENRY W. CATTELL, M.A., M.D., Demonstrator of Morbid Anatomy in the University of Pennsylvania. Sections I.–VIII. New York: The MacMillan Company, 1896.

SINCE the publication, in 1884, of the first English edition of Ziegler's *Special Pathological Anatomy*, five German editions have appeared in rapid succession. The present is the third English edition of this popular text-book. The text has been entirely retranslated and the bibliography and other supplementary portions have been recast, references to only the more recent and important papers and monographs having been included. By omitting the references to the earlier literature, which are to be found in the previous English editions, much "valuable space has been gained." Presumably the editorial work of the translators referred to on the title-page has consisted in this recasting of the bibliography, which, it must be acknowledged, has been done carefully and judiciously, although one of the most valuable features of Ziegler's text-books of *General and Special Pathological Anatomy* have been their conveniently arranged lists of bibliography. It was, therefore, a matter of disappointment to many American teachers of pathology that the recent translation of the last German edition of Ziegler's *General Pathology*, issued by another firm, omitted entirely all references to the literature. The second part of the *Special Pathological Anatomy* (Sections IX. to XV.) is already in press, and this is to be followed by a new version of the part on *General Pathological Anatomy*, prepared from the latest German edition, so that soon all the systematic works by Ziegler will be accessible to the English reader in uniform style.

The volume at present under consideration contains, as already indicated, the first eight sections of the eighth German edition of the *Special Pathological Anatomy*, namely, those dealing with the morbid anatomy of the Blood and Lymph, the Vascular Mechanism, the Spleen and the Lymph-glands, the Osseous System, the Muscles and Tendons, the Central Nervous System, the Peripheral Nervous System, and the Skin. At the end of the volume is a full index. The constantly

increasing size of the original German editions of the work makes this division of the English translation into two volumes necessary, in order to secure good typography and convenient bulk, although the practical serviceability of the translation naturally suffers some on this account, because it is not indicated on the back of the present volume what parts of pathological anatomy are here dealt with.

The translation has been carefully made, and there seems to be no occasion for any criticism. The more important designations of different morbid processes are, as in the original, printed in heavy-faced type. The reproduction of the illustrations is as successful as in the original. The good quality of the paper of the English version brings out the black and white figures with satisfactory clearness. The titles of the references have been translated into English in the case of the journal articles, while the titles of monographs and independent publications are printed in the original language. Some of the abbreviations of the names of the serial publications are, perhaps, a little anomalous, as, for instance, *V. A.* for *Virchow's Archiv.* The references have been found to be correct as far as the reviewer has had occasion to subject them to control.

Any extended review or criticism of the subject-matter proper is hardly in place at this time. The number of the German editions of the original attests to the general serviceability of the work, both as a text-book for students and as a work of reference for more independent workers. The paucity of sufficiently elaborate works on special pathological anatomy in the English language renders this translation a doubly valuable addition to our literature. It is well to bear in mind, however, that the book does not give a satisfactory summary of the contributions of American or English investigators to the subject with which it deals. Important American and English researches are not referred to as frequently as they merit. Naturally the literatures laid under contribution are the German, first and foremost, and then the French and Italian. Full justice in this respect will probably not be done the literature of "Greater Britain" until some American or English pathologist essays to summarize our knowledge of pathological anatomy in our own language in a sufficiently comprehensive manner. L. H.

THE MENOPAUSE: A CONSIDERATION OF THE PHENOMENA WHICH OCCUR TO WOMEN AT THE CLOSE OF THE CHILD-BEARING PERIOD, WITH INCIDENTAL ALLUSIONS TO THEIR RELATIONSHIP TO MENSTRUATION. ALSO A PARTICULAR CONSIDERATION OF THE PREMATURE (ESPECIALLY THE ARTIFICIAL) MENOPAUSE. By ANDREW F. CURRIER, A.B., M.D., New York City. New York: D. Appleton & Co., 1897.

THIS is a small octavo volume of two hundred and eighty-two pages, containing a complete bibliography and index. The author's extensive experience has enabled him to handle the subject in a masterful manner. He lays particular stress upon the fact that the menopause is a physiological process, and is not fraught with necessary dangers. The majority of women, despite the traditional teachings of the past, pass through it with but little disturbance. When symptoms of ill health, nervous

disorders, hemorrhage, and pain accompany the menopause, some local or general cause must be looked for. The author also combats the theory that there exists an intimate relationship between cancer of the womb and the breast and the menopause, and he makes a strong plea for early resort to surgical measures when indicated.

The book is divided into seven chapters. Chapter I. deals with historical and other preliminary considerations, and gives an interesting review of the literature of the subject and the superstitions of ancient writers in regard to it.

Chapter II. is devoted to a study of the anatomical changes in the reproductive organs as a result of the menopause.

Chapter III., which is perhaps the most valuable part of this work, is a consideration of some of the factors which influence the advent and progress of the menopause, such as age, disease and traumatism, climate, heredity, temperament, and accidental influences.

Chapter IV. is devoted to the phenomena of the menopause, normal and morbid, and their duration. It is claimed that the type of experience during the menopause should be a condition of health; it is not critical in the sense that it is dangerous to either life or health.

Chapter V. is an interesting study of the causes and symptoms of premature menopause, and Chapter VI. deals with the retarded menopause.

The last chapter is devoted to the treatment of the various local and general symptoms. The book is a valuable contribution to medical literature. The style is clear and convincing. J. B. S.

ENGLISH SANITARY INSTITUTIONS. By SIR JOHN SIMON, K.C.B., etc. Second edition. London: Smith, Elder & Co., 1897.

THE first edition of this work appeared in 1890, and the second, except for the addition of two appendices, is virtually a reprint of the original book. Although addressed to the layman, as well as the physician, and therefore not strictly a scientific work, it is the most important one in the historical development of sanitation which has yet appeared, and therefore most valuable for all members of the medical profession. The word "sanitation" is here used in its broadest sense, and not merely limited to drainage of houses and towns, but covers all those trades and occupations which directly influence the welfare of mankind. And no member of the medical profession can be considered worthy of his caste unless he takes an active interest, in so far as it is possible, both practically and theoretically in such sanitary institutions. The author of this work was for thirty years medical officer of Her Majesty's (Queen Victoria's) privy council, and may be considered as the founder of modern sanitary science. As the product of a profound scholar and able writer, and with the authority of years devoted to improving the conditions of life of all classes in the British Empire, the work is of the utmost import. Although the second half of the book is devoted almost entirely to a consideration of the legislation enacted during Queen Victoria's reign, in sanitary matters, which apply strictly to England, yet a careful study of these will be of aid to any

physician who may be attempting to form and carry through sanitary measures. In this country such matters are left so much to the individual States, cities, towns, and villages that a strict comparison between the state of affairs in England and in this country cannot be made; but, nevertheless, much help can be had from studying how to avoid making such mistakes as occurred in England and retarded the growth of sanitary improvements during the past twenty years, after the retirement of Sir John Simon from office. Had he remained in office, and had the reforms been enacted which he had so earnestly worked for during his administration, it is more than probable that England would have been spared the terrible endemics of typhoid fever which have lately been raging in some of her towns. The last two chapters of this volume deal in a broad manner with poverty, and the best means to elevate the lower classes; although but brief, the sketch is full of wise judgment, and might well be used as a basis of study by all who wish to pursue the subject further.

The first half of the book is divided, strictly speaking, into three parts: first, sanitary institutions in pre-historic and post-mediæval times; second, from post-mediæval times through the reign of the Tudors and Stuarts in England; and. third, from that time to the reign of Queen Victoria This part of the work will be found especially attractive by the layman, for as a chapter in history and welfare of mankind he will be able to see how happiness and progress in civilization are in a very great measure directly dependent on the health of the people at any given time. In connection with the chapter on Roman institutions, those interested will find much fresh information in Lanciani's "The Ruins and Excavations of Ancient Rome," 1897. With a population of over a million of inhabitants, Rome had a far better water-supply than any city of to-day, and for the poorer classes this is one of the most important factors in aiding them to be clean both in body and mind. Their tenement-houses were no better than ours—badly built and overcrowded, with rents very high, so that the poor probably suffered as much then as they do now from those evil effects which follow overcrowding.

Coming down to the middle and dark ages, Sir John Simon has traced in a most clear and instructive chapter the influence exerted by the various orders of monks on the outside world; that they did greatly alleviate suffering and increase happiness is not to be questioned for a moment, but as the orders sank lower and lower in repute, much distress and misery followed, although the seeds they had laid for the improvement of the poorer classes did last and produce much that was to be of permanent benefit.

But it was in the eighteenth century that modern preventive medicine may be said to have had its birth, and the chapter in which the author pays his tribute of devotion to, and traces the work of, such men as Mead, Pringle, Lind, Baker, Blane, Jenner, and others, is one of the most absorbing. Few know, except in the case of Jenner, how much thankfulness is due these men, who, by their work, ameliorated to an immense extent the sufferings of mankind, especially in the English army and navy. These men all belonged to the medical profession; but to such men as Howard, Wilberforce, and Granville Sharpe equal honor is due for the work they did in other departments of sanitary science. The wrong done the East Indians and the trial of Warren

Hastings developed new sympathies and produced changes of administration over conquered nations the effects of which will be permanent while civilization lasts.

It is impossible to do justice to this book in a short review; we wish only to bring out its more salient features, and trust that its inherent interest will be recognized from our short abstract. R. N.

SINFSORGANE. Erste Abteilung HAUT (Integumentum Commune). Von PROF. DR A. V. BRUNN. Handbuch die Anatomie des Menschen, herausgegeben von PROF. DR. KARL VON BARDELEBEN. Fuenfter Band, erste Abteilung. Jena, 1897.

ORGANS OF SENSE: THE SKIN.

THIS is part of an elaborate and valuable work on human anatomy, to be completed in eight volumes. It discusses the normal anatomy of the skin in a comprehensive and masterly manner, embracing most of the fine work that has been done during the past decade. It contains no less than 117 wood-cut illustrations, many of them original, comprised in eighty-six large octavo pages. We commend the volume with unqualified praise. L. A. D.

ATLAS DER SYPHILIS UND SYPHILISAENLICHEN HAUTKRANKHEITEN FUER STUDIRENDE UND AERZTE. Von DR MED. MARTIN CHOTZEN. Heft. 1 und 2. Hamburg und Leipzig (Leopold Voss), 1897.

ATLAS OF CUTANEOUS SYPHILIS.

THIS *Atlas of Syphilis and Diseases of the Skin Resembling Syphilis*, designed for students and practitioners, is likely, when completed, to be of much value, not only to the reader having a knowledge of the German language, but to others as well. The plates are small, chromolithographic, and, upon the whole, well drawn and colored. The text consists solely of brief notes of the cases depicted. Part I. contains fourteen plates, Part II. six plates. The subjects treated of in these two parts are the various forms of initial lesion in the male and female; a few of the early cutaneous eruptions; urticaria, erythema multiforme, pityriasis versicolor, maculæ following scabies, and maculæ following the macular syphiloderm of the leg.

It is stated that the work will appear in twelve parts, one each month, and will contain 109 pictures, on 72 plates (77 pictures representing syphilis, 32 non-syphilitic diseases). The price of each part will be three marks The pictures will all be original. L. A. D.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.D., LL.D.,

PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

Phesin and Cosaprin.—Drs. Zoltán v. Vámossy and Béla Fenyvesky state that the first of these is a sulpho-derivative of phenacetin and the second of acetanilid. Phesin is a reddish-brown, light, amorphous powder, without odor, of a slightly caustic and salty taste. It is readily soluble in water, coloring it Bismarck brown, and the reaction is slightly acid. Cosaprin is a grayish-white, light, amorphous powder, without odor, of a mild salty taste. It is readily soluble in water; the solution is colorless, or, if concentrated, a pale yellow; its reaction is slightly acid. The advantages claimed for these substances are as follows: 1. Their solubility is greater, and this permits of their hypodermatic use. 2. Their rapid action. 3. In comparison with their basic substances (phenacetin or acetanilid), they are harmless. The short duration of the effects of their administration is a disadvantage, but this is remedied by the successive exhibition of smaller doses. The dose should be one and one-half to one and three-quarters times that of the basic substance.—*Therapeutische Monatshefte*, 1897, Heft 8, S. 428.

Health Resorts and Water for the Anæmic.—Dr. Hermann Weber sums up an interesting paper as follows: 1. The majority of cases can be treated without either spas or special climates, although the latter can be rendered useful in most instances. 2. Anæmic patients are often in so great a state of weakness that no journey, either to spas or climatic resorts, ought to be attempted, but a preparatory treatment ought to precede the change. 3. In many cases the attention to climate is more important than to mineral waters, because the medical agents contained in the latter can be supplied pharmaceutically. In all cases in the selection of spas special attention should be paid to the question of climate. 4. Many anæmic patients do equally well at the seaside and on mountains; but, as a rule, more torpid cases are better influenced by the seaside; more excitable, better by sheltered moun-

tain resorts, in medium, not in the highest elevations. Cases with considerable dilatation of the heart ought not to be sent either to level seasides or to highly elevated places, but to mountain resorts below three thousand feet above sea-level. 5. The influence of change is so great that anæmics residing or having fallen ill at the seaside ought to be removed to the mountains, and *vice versâ*. 6. In the selection of mineral water the causes of the anæmia and the complications must always be carefully considered. Chalybeate springs are certainly not always the proper means of treatment. 7. Proper arrangement of diet and exact rules as to exercise are of the greatest importance, as well in the climatic as in the spa treatment of the anæmic. 8. The mental condition requires the most careful attention. A moderate degree of agreeable occupation and of enjoyment is usually essential; hence it is necessary to consider not merely the questions of good accommodation and food, but also the society likely to be met at the place selected, the beauty of the surroundings, the music, and everything which can occupy the mind in an agreeable way.—*The Practitioner*, 1897, No. 351, p. 235.

Poisoning from Airol.—Dr. Fritz Semmer reports a single instance from the use of this drug, which is bismuth oxyiodogallate. About an ounce of a 10 per cent. emulsion, made with equal parts of glycerin and olive oil, was injected into a psoas abscess, after removal of its contents, resulting from tuberculous spondylitis. Severe burning pain was experienced shortly after the operation, which latter was followed by headache and coryza, such as has been observed to follow the administration of iodine. These symptoms disappeared after making use of sodium bicarbonate. Three days later there was observed a swelling of both lips and severe *fœtor ex ore*. For the past twenty-four hours there had been burning pain in lips and gums, so that swallowing caused severe pain. Headache, malaise, inappetence, and nausea were also present; the movements were somewhat constipated, the temperature afebrile. The gum-margins showed a bluish-gray discoloration, and the hard palate about the teeth was bluish; the throat was slightly reddened, the border of the tongue bluish, while the tongue itself was heavily coated. The buccal mucous membrane was marked by dark blue lines and showed the impress of the teeth. The mucous membrane of the under lip was covered with similar spots, in the centre of which were small, coated ulcers. Pressure upon the teeth caused pain. The submaxillary glands were slightly swollen and sensitive. The urine was dark in color, contained a white sediment of urates, but was free from albumin. The ulcers healed under the use of potassium chlorate, although the discoloration persisted more than four weeks. Eight days from the last the symptoms required another emptying of the abscess. When this was done the cavity was found to contain some of the airol emulsion, which, being removed, was followed by a rapid disappearance of the symptoms and a clearing up of the urine. The explanation of these symptoms is to be found in the fact that bismuth is soluble in glycerin.—*Correspondenzblatt für Schweizer Aerzte*, 1897, No. 16, S. 486.

The Therapeutics of the Thyroid Gland.—Mr. H. Gideon Wells states that when the thyroid preparations are administered to animals experimen-

tally or to man therapeutically, effects are produced which can be separated into two classes: (*a*) Nutritional: The process of metabolism throughout the body undergoes a marked change, which is shown best by the urine. This is considerably increased in quantity, it contains a greater amount of urea, as well as chlorides and phosphates, as has been shown experimentally by Roos, and clinically by Napier and others. At the same time the weight of the subject diminishes, particularly if it be above normal because of fat deposition. This decrease in weight is constant and considerable, and Wendelstadt has been able to demonstrate that but one-sixth of the loss can be attributed to the nitrogenous compounds as shown by the increased nitrogen content of the urine, the rest being due to loss of water and of the fat itself through oxidation. (*b*) Nervous: Of these the most prominent clinically is the palpitation of the heart, which is a certain indication that the dosage has been carried too far. With it come headache, nausea, and vomiting, and if the remedy be pushed still farther the pulse and heart weaken to a dangerous degree. Sometimes glycosuria is produced, which can be attributed to some action on the diabetic centre, since it may develop into a true diabetes mellitus. Schäfer has also shown that if thyroid extract be injected into the veins of healthy dogs, there follows an immediate fall of blood-pressure, without any considerable change in the rate or force of the heart-beat, due to dilatation of the vessels throughout the body. Passing over myxœdema and cretinism, in which the good effects of the administration of thyroid extract are acknowledged, of 584 cases of simple goitre about 82 per cent. were relieved. From his analysis of goitrous glands the suggestion is made that not only does the normal American gland contain a much greater amount of iodine than does the German gland, but also that this amount is necessary to inhabitants of this country, so that the gland will hypertrophy to keep the iodine content up to the standard, as was shown in the report of two cases of the hyperplastic variety, from patients of foreign birth, but who had been for many years resident in this country. In both the iodine content was close to the American average. Exophthalmic goitre generally becomes much worse under this treatment, and the patient is relieved on its cessation. In obesity this failed to produce some improvement in but six of 145 cases. This, however, is not permanent, except in a few instances, unless the patient adheres to a system of dietetics and exercise. In all probability, the benefits of this treatment are due to the increased metabolism in the tissues, producing the same results as vigorous and general exercise—*i. e.*, a burning up of the superfluous carbonaceous materials in the body. In insanity it seems to be of value as a cerebral stimulant when the higher cortical cells are anergic after attacks of acute insanity; but its use is conceded to be dangerous in acute mania and melancholia. Of skin diseases, scleroderma offers a more favorable field, and improvement in all cases (Bramwell and Abraham), but no cures are reported in lupus.—*Journal of the American Medical Association*, 1897, vol. xxix., pp. 897, 954, and 1007.

[It is of especial importance that patients who are taking preparations of thyroid should be carefully observed, and the dose be so regulated that no symptoms are produced. We have had under observation a patient from whom a goitre had been successfully removed, but to whom thyroid extract had been so unskilfully administered that her condition was far worse than

before the operation. Keeping the dosage within proper limits, or systematically intermitting the remedy, would have saved the patient from permanent disability.—R. W. W.]

Antivenine in the Treatment of Leprosy.—Dr. Isadore Dyer instances Carreau's observation of a leper bitten by a venomous serpent, in whom there was marked disappearance of the tubercular lesions of the disease during recovery from the effects of the bite, and reports five instances of the use of Calmette's antivenine. The amount employed varied from one-fourth drachm to nearly three drachms, administered hypodermatically into the gluteal muscles, interscapular space, or, exceptionally, into selected leprous lesions themselves. At first the injections were made every second day; subsequently every day. Sterilization of needles and syringes, with antisepsis of hands, was made a routine practice. The results are as follows: (1) Number of injections, 42; cold sweats were the only reaction. Improvement began after the fourth injection. The changes particularly noticed were in the disappearance of infiltration from the face, the resorption of tubercles on the face and of the ear, the restoration of the eyelids from the ectropion, and the return of a normal and natural expression. Whenever local injections were made into individual lesions, the lesions disappeared. (2) Number of injections, 28; these proved to be of no benefit. The patient suffered pain at each injection; seemed to grow anæmic, and lost weight so long as the treatment was continued. (3) Number of injections, 17. This patient improved steadily from the fifth injection. There was no reaction from the treatment, and the lesions have practically disappeared. He has regained the full use of forearm and hand, which were affected, and except for a faint rosiness where the lesions were, and occasional stiffness of two fingers, there is no evidence of the original disease. (4) Number of injections, 18. The characteristic macular patches have lost all of the original livid coloring; they have broken in contour, the borders being now quite irregular and fading rapidly from the edges. The maculæ are made up of grayish, irregular spots, distributed over an area of skin healthy in color; the infiltration in these patches has gone; the sensation, which at first was absent, has returned, so that the injections are painful. The patient has now sufficient use of hands to allow active work, formerly impossible. (5) Number of injections, 10. This patient improved after the first injection, notably as to the eruption on the face. In short, in four of these patients there was marked improvement; in one there was a practical disappearance of the lesions present. In one only was there failure, and here the age and frailty of the patient must be considered.—*New Orleans Medical and Surgical Journal*, 1897, No. 4, p. 1177.

[Calmette's antivenine is undoubtedly the most reliable. We hope that this report will encourage further investigation.—R. W. W.]

The Treatment of Trismus and Tetanus.—Dr. Th. Weischer reports two successful instances of the use of Behring's serum. In seventeen years there have been observed in the Cologne hospital twelve cases of tetanus and six of trismus and tetanus without manifest cause. Of these ten died. Omitting the two instances here reported, the death rate was 62.5 per cent. Of ninety-eight cases collected from the literature which received tetanus

serum, forty-one died, which is a mortality of 41.8 per cent.—*Münchener medicinische Wochenschrift*, 1897, No. 46, S. 1284.

Dr. G. O. Coffin reports a single instance. Treatment was begun by the injection of half an ounce of this serum six days after the disease had begun. This amount was repeated one or more times daily, and in addition morphine sulphate, chloral, and sodium bromide were administered. The patient recovered.

Dr. J. W. Foster reports an instance where the treatment was commenced four days after the onset of the disease, and thirteen days after the reception of the injury. In addition chloral, potassium bromide, cannabis Indica, and hyoscyamus were administered. The disease reached its climax about the tenth day, and then gradually subsided.—*Therapeutic Gazette*, 1897, No. 11, p. 734.

[In the last two cases the evidence is strong that the antitetanic serum exerted a marked influence for good and materially aided recovery. Of course, each received active medication in addition, which prevents the evidence from being conclusive, yet these are among the most convincing of the cases hitherto reported.—R. W. W.]

Bone-Marrow.—Dr. P. Musetier, noting the effect of bone-marrow in hæmatopoiesis and the part which it plays in the constitution of the blood, and notably in the formation of the white corpuscles, believes that it would be natural to make use of this substance in simple anæmias. Already Brown-Séquard has made use of extract of spleen with this after severe hemorrhage, whether experimental or accidental, and in chlorotic or anæmic subjects. Instances of its successful use in pernicious anæmia have already been reported. In seven cases of chronic paludism good results have been reported from the use of the two substances. So also in leucocythæmia, when arsenic had failed the results were excellent, although relapse occurred after cessation of the treatment. Apparently in the secondary anæmias and particularly in chlorosis, the results have been most satisfactory.—*Bulletin Général de Thérapeutique*, 1897, 8e liv., p. 289.

Sanose.—Drs. Schreiber and Waldvogel report upon this albumin preparation, which consists of 80 per cent. casein and the remainder albumose. It occurs as a white, odorless, tasteless powder, which forms an emulsion with water. It may be administered in milk or cocoa (2–5 to 50), or in bean soup, about a drachm to the spoonful. It can also be added to nutritive enemata. Fourteen instances of its use are cited, showing changes in body-weight, total nitrogen, urea, uric acid, phosphoric acid, and daily amount of urine.—*Deutsche medicinische Wochenschrift*, 1897, No. 41 (Beilage), S. 65.

[This preparation promises much; its taste is by no means unpleasant, and thus far our use of it has been satisfactory.—R. W. W.]

Eucasine in Pediatrics.—Drs. A. Baginisky and P. Sommerfeld report two instances of its use, the observations being carefully carried out. They conclude that this substance does not disturb digestion; the nitrogen output is somewhat increased, while the uric-acid excretion is markedly diminished by its use, and that it is as useful a food for children as are other albumins, as meat and egg-albumin.—*Therapeutische Monatshefte*, 1897, Heft 10, S. 516.

Somatose as a Galactagogue.—Dr. Richard Drews, from an extended experience, recommends this substance whenever the milk is checked from disease, mental or other disturbance, or when, although the glands are well developed, they do not secrete properly, in order to avoid the danger of the artificial feeding of children. Naturally, if the mother is suffering from a disease during which she should not nurse, this remedy should not be used. —*Therapeutische Wochenschrift*, 1897, No. 45, S. 1157.

Olive Oil in the Treatment of Typhoid Fever.—Mr. Owen F. Paget has attended more than one hundred patients suffering from this disease, who were placed under the most disadvantageous circumstances, without deaths. He injects by the bowels from quarter to half a pint for the first four or five days, at intervals of from twelve to twenty-four hours. After the fifth day it may be given every second day, or left off entirely if the patient is having natural motions at least every twenty-four hours, and if the temperature is steadily falling. If there is great intestinal accumulation and the bowel is paralyzed, the oil should be given by the mouth, a cupful at a time, until the bowels respond; then the injections will suffice.—*The Lancet*, 1897, No. 3874, p. 1383.

[The principle which underlies all successful treatment in this disease—to limit the results of the infection at its point of greatest activity—is so frequently lost sight of that it is worth while to note the various methods of accomplishing this.—R. W. W.]

Stimulation of the Gastric Mucous Membrane to Aid in the Absorption of Important Drugs.—Dr. H. A. Hare reports his clinical observations based upon the results obtained from four patients. Cachets containing three grains each of potassium iodide were administered to patients, none of whom were suffering from any known gastric lesion or functional disturbances, and convalescent. The saliva was tested every two minutes until the iodine reaction was found. Several days later the cachets, with the same amount of the iodide, to which was added one grain of powdered capsicum, were administered to the same patients. Three of the four showed a decided gain in the time required to give the iodine reaction in the saliva. It is evident, therefore, that the use of a gastric stimulant aids very materially in the absorption of the other drug, and the moral would seem to be that whenever it is possible it is well to combine with that drug some gastric stimulant to aid in its absorption. This is particularly necessary if there is any reason to believe that the stomach is in a state of atony, as evidenced by a relaxed tongue and a history of excessive eating or drinking or chronic catarrh.—*Therapeutic Gazette*, 1897, No. 11, p. 731.

The Value of Belladonna in the Treatment of Chronic Constipation and Lead Colic.—Dott. Gaetano Traversa, from an elaborate study, concludes that in lead colic, whether due to direct excitation of the intestinal ganglia, or of the abdominal fibres of the vagus, or to simple accumulation of hard and dry feces in the intestine, from reflex action upon the contraction of smooth muscular fibres consecutive to primary irritation of the sensory nerves, belladonna or its alkaloid, by diminishing, more or less completely and in different degrees, the irritability of the peripheral nervous apparatus,

takes away an indispensable factor whereby abnormal stimuli operate through the nerves in increasing the contractility of the smooth muscular fibres. After careful investigation, it is evident that neither belladonna nor atropine is indicated in the treatment of constipation dependent upon intestinal atony. They can be used with advantage, however, in all the painful and spasmodic attacks which result from hyper-excitability of the nervous apparatus which presides over the contraction of the intestine.—*Il Policlinico*, 1897, No. 24, p. 601.

Tannoform.—Dr. Carl Sziklai has successfully treated forty children, suffering from intestinal catarrh, with this remedy. He administers one-sixth to one-half a grain, according to the age of the patient, and usually two or three doses will check the diarrhœa, but rarely so many as ten will be required. In adults, intestinal catarrh, even diarrhœa of the tuberculous, and dysentery, yield to this remedy; in the last a preliminary dose of castor oil should be given. Its favorable effect in hyperidrosis when used as a dusting powder is commented upon.—*Therapeutische Wochenschrift*, 1897, No. 41, S. 1050.

[Our own observations seem to indicate that this drug is too irritating for internal use.—R. W. W.]

Holocaine in Ophthalmology.—M. J. Chevalier finds no difference between the anæsthetic action of this substance and that of cocaine as ordinarily used. Forty-two operations have been performed, using a 2 per cent. solution by instillation. In case of ectropion or chalazion, fifteen minims of a 1 per cent. solution were injected. For instillation four or five drops are used, later three or four immediately before the operation, and this must frequently be repeated during it, for the effect seems to last about ten to twelve minutes. The solution should be prepared in a porcelain capsule with hot distilled water, and thus prepared will keep indefinitely, although it gradually diminishes in anæsthetic power. In the same amount it is more poisonous than cocaine, but since it is used in weaker solutions it can be employed with a greater sense of security. On the other hand, outside of ophthalmic work, it should be administered with great caution if large amounts are necessary, for death occurs without prodromes. Anæsthesia comes on rapidly, generally within a minute and one-half. Even in inflamed eyes anæsthesia appeared as usual. It apparently has no effect on the vasomotor system, nor does it change the tension, but there comes dilatation of the pupil. It apparently does not dry or otherwise injure the cornea.—*Bulletin Général de Thérapeutique*, 1897, 20e liv., p. 609.

A Caution Against the Use of Kerosene in the Treatment of Pediculosis Capitis.—Dr. Maurice Eden Paul comments upon one of the more convenient methods of treating this condition. Kerosene instantly destroys the lice, loosens the nits, and soothes the cutaneous irritation. The recent death from burns consequent on the spontaneous igniting of hair that was being washed after the application of a lotion consisting principally of kerosene, makes it necessary, however, to reject this as a parasiticide. In this instance the ignition was not brought about by any naked light, and

it is suggested that an explosive mixture of air and kerosene vapor was formed in the interstices of the hair, and was then ignited by an electric spark formed by the friction of the hair.—*The Lancet*, 1897, No. 3874, p. 1385.

Captol.—Dr. G. Eichoff reports that this is a condensation product of tannin and chloral, which occurs in a dark-brown, hygroscopic powder, with difficulty soluble in cold, but readily in warm water and alcohol, and which is decomposed by alkalies. It combines the astringent action of tannin with the antiparasitic of chloral. It is used in seborrhœa in a 1 or 2 per cent. solution in alcohol, as a lotion for the hair twice daily. Within one or two weeks the scales diappear, the secretion from the sebaceous glands lessens, and the falling of the hair ceases. It apparently possesses no disadvantages and can be used as a prophylactic.—*Deutsche medicinische Wochenschrift*, 1897, No. 41.

Hyoscine Intoxication.—Dr. Augustus A. Eshner reports that after the hypodermatic injection of one-hundredth of a grain there was extreme muscular weakness, loss of consciousness, flushes of face, a hard, tense, full, and rapid pulse, noisy, rapid respirations, twitching of hands, moist skin, and cool and free perspiration. Nine hours later the patient was unable to recall anything of the events which had transpired. The urine contained no albumin, but numerous hyaline and granular casts, which had been noted on previous occasions.—*Therapeutic Gazette*, 1897, No. 10, p. 668.

Poisoning by Trional.—M. Fontoynont, in the course of a paper on the pharmacology of this drug, states that it is not very poisonous; about one and one-half times as poisonous as sulphonal. Two drachms in one instance and four in another have been taken without fatal results. There is, however, a chronic poisoning, perhaps more serious, which is brought about by too long duration of treatment without interruption, constipation, which favors its accumulation, sex (the female sex being more senstitive to the action of hypnotics), and finally the dose ingested. The symptoms are an obstinate constipation, diminished quantity of urine, nervous disturbances, and hæmatoporphyrinuria. The last is recognized by the empyreumatic odor of the urine, which resembles that of acetone, and its dark-red color by reflected, and reddish-brown by transmitted, light. Yet it should be added that the presence of hæmatoporphyrin in the urine is not necessarily a sign of trional-poisoning, for it has been observed when neither trional nor sulphonal has been absorbed.—*La Presse Médicale*, 1897, No. 95, p. 307.

What Causes Copaiba and Other Symptomatic Rashes?—Dr. David Walsh notes that this drug has often obvious effects upon the skin and that it is excreted by the lungs and kidneys. It is also an epithelial irritant, but its action appears to be greatly influenced by the susceptibility of the individual. Assuming that symptomatic dermatitis ensues as a part of a general excretory action, the practical conclusion is obvious that any drugs which cause mischief to the skin should be given with great caution, lest they injure other organs.—*Medical Press and Circular*, 1897, No. 3058, p. 607.

MEDICINE.

UNDER THE CHARGE OF

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Pulmonary Tuberculosis Following Traumatism.—All the cases of so-called traumatic pulmonary tuberculosis hitherto reported have been unsatisfactory in showing the relation claimed. DR. O. SCHRADER (*Berlin. klin. Wochenschrift*, 1897, No. 46) furnishes an account which leaves little to be desired. A healthy man, aged twenty-nine years, with no tuberculosis in the family history, fell heavily on the right side of the back. The fall was so severe that the patient was unconscious a quarter of an hour, and felt ill afterward. The next day he began to work again, but was obliged to give up, and was admitted to the hospital with signs of pneumonia in the upper and middle lobes. The consolidation continued, with a remittent fever. In the beginning the sputum was negative, but on the fortieth day after the fall tubercle bacilli were found. By another month the fever disappeared. Soon after the physical signs had improved so much that only slight loss of resonance could be detected. Bacilli could not be found. [Treatment not described.]

The author inclines to the belief that the pneumonic process was tuberculous from the beginning, basing his opinion largely on the fever type. [The temperature curve as given might be that of sepsis.] Whether the patient already had a latent tuberculosis, or became infected after the injury, perhaps in the hospital, the author does not say. The course of the symptoms, the seat of the lesions, and the accuracy of the observation go to support the author's claim as to the relation of the injury to the disease.

An Albumose Substance in the Urine in Sarcomatosis of the Bones of the Trunk.—ROSIN (*Berliner klin. Wochenschrift*, 1897, No. 48) reports a case in which the patient for many weeks excreted in the urine a substance which had the general characteristics of an albumose. The more minute chemical details the author proposes to describe elsewhere. The patient was a woman of thirty-six years, the clinical diagnosis, nephritis with albumosuria and central hypoglossus and trigeminus paralysis. Autopsy revealed amyloid, fatty, and necrotic changes in the kidneys, without nephritis. There was a new growth affecting many ribs, originating in the marrow, identified as myelogenic round-celled sarcoma. The ribs were softened as in osteomalacia, but without deformity.

The most interesting feature of the case was the excretion of albumose. This could evidently not be due to the renal disease. An examination of the

literature makes it very probable it was related to the disease in the bones. Since the case of Bence Jones, usually described as one of osteomalacia, six cases have been described in which the two things occurred together. From the results of the later examinations it seems clear that all of these were cases of multiple sarcomatosis rather than osteomalacia properly speaking. It seems also that sarcoma of the bones of the body, especially the ribs and vertebræ, is associated with albumosuria, while sarcoma of the face and extremities is free from it. Later investigations must determine whether the albumose substance is formed in the tumors and then excreted with the urine, or if it comes from the blood-serum.

Symptoms Due to Intestinal Parasites.—E. PEIPER (*Deutsche med. Wochenschrift*, 1897, No. 48) gives a number of interesting details on this subject. A case in which severe symptoms, resembling those of meningitis, rapidly disappeared after the expulsion of a number of round worms serves to introduce some remarks on the possible explanation of such cases. The common explanation is that the nervous symptoms are reflex, due to irritation by the worms in the intestine. Peiper does not deny the possibility of this, but thinks that another explanation is more probable, namely, that the parasites produce poisons which act on the nervous system. Peiper gives due credit to Von Linstow for his researches on the toxicity of the helminths. The older literature contains many references to the dangers of ascarides. Many modern authors report cases in which severe symptoms seemed due to no other cause.

So, attacks of severe opisthotonos (Lutz), hysterical convulsions (Mosler), hydrocephalus symptoms, with hemiplegia (Eichberg and others), even fatal nervous symptoms with those of ileus (Mosler), severe anæmia (Baelz, Leichtenstern, and others), have been traced beyond doubt to these parasites. As to the presence of toxic substances von Siebold mentioned attacks of sneezing, lachrymation, and itching and swelling of the fingers after handling ascarides. Huber and Küchenmeister have mentioned the peculiar odor of the round worms, and Leuckart, who observed that it was extracted by alcohol, supposed it might reside in an oil. Von Linstow and Raillet have each noticed swelling of the conjunctiva after working with ascarides. Arthus and Chanson, who found an irritating substance in ascarides from a horse, found that 2 c.cm. of the juice of such a worm produced violent symptoms and finally death in a rabbit. Why severe toxic symptoms are not oftener observed in cases of ascariasis is difficult to explain. Perhaps duration of the disease and number and activity of the parasites are important.

Many interesting details are given regarding the toxic symptoms due to tapeworm and echinococci. Brieger obtained the platinum salt of a substance in echinococcus fluid that was fatal to mice. In the case of tricocephalus, and also of oxyuris, the observations have not been carried as far as with some of the preceding, but the symptoms of trichinosis point to a toxic influence. Experiments with the feeding of intestinal worms to animals show a great toxicity. Further experiments are promising of important results.

Pyogenic Cocci in the Blood in Pulmonary Tuberculosis.—HIRSCHLAFF reports from Stadelmann's clinic (*Deutsche med. Wochenschrift*, 1897, No. 48)

along with some investigations on mixed infection in various diseases, some results in phthisis that are of interest in connection with previous reports of various observers. The author examined thirty-five cases of pulmonary tuberculosis, in which remittent fever seemed to indicate a mixed infection. He cultivated blood taken with aseptic precaution from the median vein on various media. Positive results were obtained only four times. This is in striking contrast to the results of Michaelis, who found cocci eight times in ten cases. In Hirschlaff's cases staphylococci were obtained of very low virulence. This is interesting in connection with the fact that metastatic abscesses did not occur in these cases. The author thinks the cocci came not from the lung parenchyma, but from cicatricial tissue, as Spengler found in cases of streptococcus and diplococcus mixed infection.

A Symptom-complex Resembling Peritonitis in the Last Stage of Addison's Disease.—W. EBSTEIN calls attention to a condition which he has seen several times in patients with Addison's disease. In fact, the first case he saw was one in which Addison's disease was not made out during life, but the adrenals were post mortem found to be tuberculous. The patient began to complain of tenderness over the right half of the abdomen. There was a diffuse resistance to the right of the umbilicus. Along with a pseudo-membranous angina there were diarrhœa, dyspnœa, anxiety, and collapse. The patient died in ten days after the onset. There was no discoloration of the skin. In a second case the diagnosis of Addison's disease was also by no means clear. The patient died after the onset of acute symptoms lasting a week, with pain and retraction of the abdomen, pain in the knees, heels, and finger-tips, vomiting and subnormal temperature. The adrenals were cheesy; there were fresh tuberculous lesions in the abdominal lymph-glands; pigmentation of the mucosa of the intestine. In the third case there was pigmentation of the skin. Chills, pain in the extremities, and pain in the side introduced the final illness. Eleven days before death severe and frequent vomiting began, with diffuse pain in the abdomen and rigidity of the abdominal muscles. As in the other cases there was but little elevation of temperature, pulse up to 100, urine free from albumin and sugar, quantity 1800 c.cm. Post mortem were found cortical atrophy of both adrenals, swelling of all lymphatic organs, slight retraction of the apices of the lungs, narrow aorta, hyperæmia of most of the abdominal organs. There was no induration around the adrenals or in the cœliac plexus. In a fourth case no autopsy could be obtained.

All the patients were men, between twenty-seven and thirty-three years of age. In all consciousness was preserved to the end. There were no symptoms except those noted in the second case. Diarrhœa was not present in the final stage. No anatomical cause for the terminal abdominal symptoms could be discovered. The chief lesson of the observations at present is that symptoms like those described should lead to the consideration of adrenal disease, even if the characteristic pigmentation is not present.—*Deutsche med. Wochenschrift*, 1897, No. 46.

A Case of Amusia.—KNAUER (*Deutsche med. Wochenschrift*, 1897, No. 46) reports an interesting affection. The patient was an intelligent woman,

thirty years of age; a cultivated musician, whose father, also highly intelligent, was the subject of nervous and mental diseases. The patient had Graves's disease and was hysterical. Suddenly, at night, she lost her sense of sound and musical-tone pictures. There was ringing in the ears, dizziness, choking paroxysms, headache, attacks of unconsciousness without aura, diminished hearing in both ears, and sleeplessness. Frequently ringing in the ears would pass over into melodies, as in the case of the composer Schumann. If one person spoke, she was sometimes able to understand; if several spoke at the same time, only a confused buzzing was heard. The resemblance of many of these symptoms to the group described by Ménière is very great. The author also alludes to the possibility of their being due to thyroid intoxication. The symptoms relating to the musical sphere are of a different kind. These consist in a music- or tone-deafness. Ability to sing was present, but impaired. Corresponding to the disturbance in the aphasic complex known as paraphasia, the condition could be called para(noto)graphia. It would, perhaps, not be erroneous to say that the tone and word-picture centre and the tone and word-motor centre are close together, the former in the first left temporal, the latter in the third left frontal convolution. These relations are made clearer by a schema and a diagram of the convolutions concerned. The short but important article has a list of references to other articles on the same subject.

Cardiac Hypertrophy in Arteriosclerosis.—HASENFELD (*Deutsche Archiv für klin. Med.*, Bd. 59, p. 193) has made an investigation of this subject in the Leipsic pathological and clinical laboratories. The details are of great interest, but, with the tables, must be consulted in the original. The conclusions are as follows:

Even physiologically, the splenic, hepatic, and superior mesenteric arteries have a small amount of connective tissue in the intima.

Arteriosclerosis of mild or moderate degree, only microscopic, is quite common in the splanchnic arteries, but marked sclerotic changes are much less common than in the aorta, the arteries of the extremities and the brain.

Sclerosis is usually most marked on the main trunks of the splanchnics, and becomes less in the branches.

Arteriosclerosis only leads to hypertrophy of the left ventricle when the splanchnics or the thoracic aorta are severely affected. Arteriosclerosis of the other vessels does not seem to have such an effect.

In the five cases of contracted kidney examined, all the chambers of the heart were hypertrophied. If at the same time there was marked sclerosis of the splanchnics, the hypertrophy was most marked in the left ventricle. Extreme sclerosis of the aorta would probably have the same effect.

Should further examinations confirm the results now given as regards the uniform hypertrophy of all parts of the heart, we must conclude that the cause of hypertrophy in contracted kidney increases the work of both sides of the heart and probably excites the heart to increased activity.

The Impossibility of Immunity against Influenza.—Clinical experience shows that influenza not only does not confer immunity against future infection, but actually seems to favor it. This is confirmed by animal experi-

ments carried on by DELIUS and KOLLE (*Zeitschrift für Hygiene*, Bd. xxiv.). By what must be considered a remarkable exhibition of skill and perseverance, they cultivated large quantities of influenza bacilli in pigeon-blood and bouillon and on blood-agar. With these cultures—less readily with filtrates—they were able to kill guinea-pigs with symptoms resembling those of cholera, typhoid fever, etc. By none of the known methods were they able to produce immunity. In guinea-pigs, rabbits, dogs, sheep, and goats a certain degree of resistance was obtained against the poison, but neither antitoxic nor bactericidal effects were obtained.

A Case of Alcaptonuria.—HIRSCH (*Berliner klin. Wochenschrift*, October 4, 1897) reports a case of alcaptonuria in a young girl, aged seventeen years, who, for eight days, had suffered from gastro-intestinal catarrh. Nausea and vomiting were the chief symptoms complained of when the patient came under observation. These were associated with slight elevation of temperature.

On the morning after admission the urine presented a brownish-black color similar to that seen in carbolic acid poisoning. When first voided the urine was browner or darker than normal, the color deepening on standing. Some of the urine was allowed to stand overnight. The following morning the urine was still acid in reaction and had become an inky-black color. It was so dark that the intensity of the color was not increased by the addition of alkalies, as is usually the case in this condition. The total amount of urine for the first day that this peculiar feature was observed was 700 c.cm.; reaction weakly acid; sp. gr. 1018. There was no albumin. Fehling's solution was reduced when heat was applied. Nylander's test was negative. Prof. Siegfried extracted an acid from the urine which gave the following reactions: 1. Alkaline solutions of the acid took on a dark-brown color. 2. Ammoniacal silver solutions were reduced in the cold. 3. Fehling's solution was reduced on the application of heat. 4. Very dilute solutions of chloride of iron produced a transitory blue color. 5. The acid yielded a lead salt, which was slightly soluble in cold water. From these reactions it was concluded that the substance in the urine giving rise to them was alcapton.

On the fourth day, after the peculiar darkening of the urine was first noticed, these features entirely disappeared, and the urine became once more normal. The patient had never noticed the same darkening of her urine before, and there was no family history of the disease.

Boedeker first described the condition in 1859, and called it alcaptonuria. The chemical substance causing the change in the urine is believed to be one or the other of the two following acids: (1) uroleucinic acid (Kirk), or (2) homogentisinic acid (Baumann).

Hirsch gives the following as the interesting features in this case: 1. The appearance of the alcaptonuria during an attack of acute gastro-intestinal catarrh.

2. The short duration (three days).

3. In spite of the urine remaining weakly acid the color deepened so intensely that there was no increase in the depth of color after the addition of an alkali.

Phthisis and Child-bearing.—TOWNSEND (*Boston Medical and Surgical Journal*, October 14, 1897, p. 391) draws the following conclusions from the study of twenty-four cases of pregnancy in patients suffering from pulmonary tuberculosis:

1. Conception may take place even in advanced pulmonary tuberculosis.
2. The disease is generally held in abeyance during pregnancy, although it may advance or even originate at this time.
3. Labor is short and easy in proportion to the severity of the disease.
4. During the puerperium a rapid advance, leading in some cases to speedy death, occurs; or the disease may originate at this time. In either case the temperature-chart suggests puerperal sepsis.
5. Premature labor is more common the more advanced the disease, although pregnancy often goes on to full term even in advanced cases.
6. The average weight of the full-term children and their general condition at birth are not markedly below those of children of healthy mothers, except in the rare instances of congenital tuberculosis.

SURGERY.

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Temporary Intra-abdominal Compression of the Aorta above its Bifurcation in Operations for Pelvic and Abdominal Tumors.—In connection with the details of a successful operation for double malignant ovarian tumors, with many adhesions, LENNANDER (*Cent. für Gynäk*, No. 17, 1897) describes a method of digital intra-abdominal compression of the aorta which he employed with very gratifying results. The deductions which he draws from this case are the following:

1. A wide compression on the aorta above its bifurcation makes the entire true pelvis practically bloodless.
2. If the common iliac artery is compressed on the vertebræ or the os sacrum above the sacro-iliac synchondrosis, the half of the pelvis is rendered nearly bloodless.
3. The compression was employed for three-quarters of an hour in this instance, with no serious effects; it should not be necessary longer.
4. When the compression ceases, a rapid lowering of the heart's action, due to vasomotor dilatation, should be guarded against by a normal salt solution, intravenous injection.
5. In resections of the spleen or the extirpation of a fixed spleen, the arteria

linealis at the upper end of the spleen may be compressed against the vertebræ.

6. In severe and difficult operations upon the kidney, where the peritoneal cavity is necessarily opened, the compression of the renal vessels against the vertebræ will be of service.

The author adds a foot-note of the fact, just discovered by him, that Senn had previously suggested intra-abdominal compression of the aorta in military surgery.

Solid Tumor of the Mesentery.—HARRIS (*Annals of Surgery*, July, 1897) reports a rare case of tumor of the mesentery which weighed five pounds, and proved on microscopic examination to be a "lympho-sarcoma flexiform with colloid degeneration."

The tumor was situated in the mesentery and was crossed by an entire loop of jejunum, which it was necessary to sacrifice in order to remove the tumor; it was resected on either side of the tumor, the tumor removed, and the gut united by end-to-end anastomosis. The patient, who was a boy, five years old, made an uninterrupted recovery, and was in excellent health ten months after the operation.

Gastrostomy for Malignant Disease of the Œsophagus.—The objects to be attained by this operation are the easy administration of food, its complete retention, and freedom from excoriation, coupled with a low mortality from the operative interference. These results BARLING (*Birmingham Medical Review*, June, 1897) believes can be best attained by Albert's operation. He has successfully performed this operation in three cases of malignant disease; one patient died subsequently from the spread of the disease; all had great relief and gained in weight, while none of them had any distressing symptoms.

The operation which he employed is the following: A nearly vertical incision about three inches long is made over the outer parts of the left rectus, commencing an inch or more below the left costal margin. The anterior layer of the sheath of the rectus is opened, the muscular fibres are separated and pushed to the outer side, and the posterior layer of the sheath and peritoneum are divided. The stomach is exposed at once, as a rule, but care must be taken that the transverse colon is not picked up by mistake. A pouch of the stomach, as near the cardiac end as can be conveniently managed, is then pulled into the wound, and a running suture passed around the base of the pouch stitches it to the parietal peritoneum and edge of the rectus sheath. The next step is to make a short transverse incision through the skin over the margin of the ribs about one and one-half inches above and directly in line with the upper end of the first incision. The bridge of skin between the two incisions is lifted up, the pouch of stomach is pulled under this bridge and its apex stitched to the small skin incision. A couple of stitches are first inserted, the stomach is then opened by a small puncture, two or more additional sutures are applied, and then a small tube is passed into the stomach and so fixed that it cannot slip in or out and that no leakage can take place through it. The main incision is then sutured so that the stomach is covered in. If very necessary, food may be administered at once,

but it is better to wait for some hours, lest vomiting should be induced after the anæsthetic.

Three Successful Operations for Thrombosis of the Lateral Sinus Following Otitis Media.—DAHLGREN (*Arch. für klin. Chir.*, Bd. lii., Heft 3) reports in detail the following cases of thrombosis of the lateral sinus which were successfully operated upon by Lennander and the author:

CASE I.—Acute purulent otitis media following influenza. Empyema of the mastoid antrum with otitis and periostitis of the mastoid region, thrombophlebitis of the sinus transversalis, with pyæmia and abscess formation in the femur. After opening of the mastoid antrum, it was curetted and washed out; an exploring needle showed the absence of blood from the lateral sinus (the osseous wall was wanting); it was opened, found to be thrombosed, curetted; the internal jugular vein was ligated to prevent further spread of the thrombi, and the wounds then packed with iodoform gauze soaked in boroglyceride. The patient made a complete recovery and was entirely free from any further symptoms of phlebitis, thrombosis, or pyæmia.

CASE II.—Chronic purulent otitis media, with a cholesteatoma of the mastoid antrum and catarrh of the mastoid cells. Extradural abscess of the posterior cranial fossa, with thrombo-phlebitis of the transverse sinus and internal jugular vein. There was an accompanying incipient pyæmia. Stacke's operation was performed, and after ligating the internal jugular vein the lateral sinus was opened and curetted. The patient made a good recovery. The cause of the abscess-formation was the blocking of the middle ear by a polypus.

CASE III.—There was present inflammation of the mastoid following an acute otitis media, but without perforation of the drum of the ear. There was a phlebitis of the lateral sinus. The symptoms pointed to a simple otitis media, and show to what a grave degree the surrounding parts may become involved without perforation taking place or symptoms arising of a more severe character. The most intense inflammation was in the mastoid antrum, which apparently became infected late in the disease of the middle ear, and was intensified by the occlusion of the communication with the middle ear. The mastoid antrum was opened, curetted, the internal vein ligated, and then the transverse sinus opened and curetted. The patient recovered completely.

Cancer of a Movable Kidney.—LEGNEN (*Ann. des Mal. des Org. Genito-urin*, No. 6, June, 1897) reports an interesting case of primary cancer of a movable kidney. The patient had no pain and no symptoms other than an occasional appearance of blood in the urine, an increasing loss of weight, with increase in the size of the abdomen, where a tumor the size of an infant's head could be easily detected, occupying the right lateral half of the umbilical region. It was fluctuating and dull on percussion; it could easily be displaced into the lumbar region laterally, upward, and downward into the pelvis. Pelvic examination showed the uterus and appendages to be perfectly normal and that the tumor had no connection with them. The laparotomy disclosed the true nature of the disease and confirmed the diagnosis which had previously been made. There were no adhesions, and the tumor

was readily and rapidly enucleated. Glands were felt enlarged along the ascending vena cava, showing that, although no adhesions had taken place, lymphatic infection was undoubtedly present, making a return of the disease certain. The patient made a rapid and complete recovery, despite her poor condition, while there was very little shock from the operation. Microscopical examination showed the tumor to be a cylindrical epithelioma.

Certain Points in the Causation and Treatment of Spinal Curvature.—BARWELL (*British Medical Journal*, August 7, 1897) calls attention to the fact that many cases of spinal curvature arise from an amesial position of the pelvis. He describes his method of studying these deflections of the body from the perpendicular, and calls attention to the importance of their recognition and correction if certain cases of spinal curvature are to be corrected. A convenient method of judging the amount of amesiality is to have the patient strip to the hips, with the feet and ankles showing below; a plumb-line is then held in such a position that the surgeon standing directly behind sees it fall midway between the heels, the amount of deflection from the perpendicular can then be judged by the distance of the intra-gluteal fold to the right or left, or the distance of the trochanters from the median line. The relation of the spinal column to the line should also be carefully noted.

The author believes it to be impossible to correct a curve caused by this malposition while that condition continues. Success in correcting this deviation and bringing the base of the spine to a normal position will go far toward correcting the spine above by the very necessity of balance. In incipient cases this measure alone will suffice.

Mesenteric Cysts.—After a careful and comprehensive study of the literature of this subject, with the report of a number of interesting cases, both of his own and others, MOYNIHAN (*Annals of Surgery*, July, 1897) gives the following as the symptoms, diagnosis, and operative method of treating these rare tumors:

Cystic disease of the mesentery is much more common in women than in men. The only form of cyst found with perhaps equal frequency in the two sexes is the hemorrhagic, as one might suppose from the mode of origin. Dermoid cysts have been found only in women. The extremes of life are not exempt from this disease. Cases are recorded at the age of four months, of two years, of six years, and at the advanced age of eighty years, and of seventy-seven years, and seventy-three years. The size of the tumors are extremely variable. They are sometimes so small as to be of no clinical significance, to cause no symptoms, and to require no treatment. They are sometimes so large as by their mere physical bulk to cause death, as in a case that has been mentioned by Portal.

The tumor is generally rounded, more or less spherical in form, and may be of even outline, or may be lobed. The most prominent part of the tumor is generally near the umbilicus, perhaps most commonly is slightly to the right of that point, approaching it more nearly as the cyst enlarges. The umbilicus never becomes protruded. The most obvious and the most characteristic sign of the tumor is the mobility. A cyst can readily and with freedom be pushed over from one side of the abdomen to the other, and to a

less extent can be moved in a vertical direction. There is resonance all around the tumor and a belt of resonance across the tumor where the intestine crosses it. The author warns against the exploratory puncture; its dangers are readily recognized as too grave.

The cysts may be so small in size and so quiescent as to have no clinical symptoms or be of clinical significance, and may be discovered only during an operation or at a post-mortem examination. Other cases are classified under two headings: (1) Those in which the course is chronic, where complaint is made chiefly of an abdominal tumor. (2) Those in which the onset of acute intestinal obstruction first draws the attention of the patient or practitioner to the abdomen.

The symptoms in chronic cases are pain, which is more or less acute, depending on the rapidity of the growth of the tumor. The more rapid the growth the greater the severity of the pain, and *vice versa*. The pain is local in and around the tumor, and radiating to the flanks, groin, and thighs. As the result of pressure exerted on the intestine and the consequent partial closure of the canal, there are colicky pains, due to vermicular contraction of the hypertrophied muscular fibres as they attempt to overcome the obstruction. There may be, but most commonly is not any, tenderness of the abdomen.

Constipation is the rule, but the severity and duration of it will, of course, largely depend on the position, duration, and size of the tumors. There is sometimes vomiting, and very rarely there may be persistent and intractable diarrhœa.

The signs in acute cases are those of an acute intestinal obstruction, vomiting, complete constipation, distention of the intestine, and the usual affections of the circulatory and respiratory system. There is one symptom that is mentioned as occurring in both acute and chronic cases—general wasting, which is occasionally extreme, and is presumably due to interference with the lacteals of the mesentery.

The causes which have been suggested as bringing about acute obstruction are: Irritation of solar plexus by pedicle of cyst; compression of the intestine, amounting in some cases to gangrene; formation of adhesions and strangulation by them; onset of acute peritonitis, owing to the rupture of the cysts or pedicle, and strangulation over a band formed by the pedicle of the cyst, as in one of the author's cases.

The differential diagnosis is to be made from ovarian and parovarian cysts —this is a frequent error—tumors of kidney, liver, spleen, and pelvic tumors. Cysts of the urachus, pancreatic cysts, and lipoma of the mesentery are likely to be difficult of differentiation. A fluctuating tumor which lies at first laterally, but which, enlarging, tends to occupy the midlle of the abdomen, which, pointing toward the umbilicus, is freely movable, especially in transverse direction, capable of rotation on its own axis, surrounded by a zone resonant on percussion and crossed by a belt of resonance, can be no other than a mesenteric cyst.

Unoperated cases terminate by retrogression or quiescence of the cyst; perforation into the intestine, and discharge through that direction; perforation into the peritoneum, and the onset of acute peritonitis; extreme emaciation and death; acute intestinal obstruction.

Operative interference is necessary in both acute and chronic cases. The cyst may be stitched to the abdominal parietes and opened and drained. The cyst may be removed either by cutting through the opening layers of peritoneum in the pedicle, inverting the edges, and applying a series of Lembert sutures, draining the peritoneum or not, according as may seem fit, or if no pedicle is found the peritoneum may be incised over the centre of the tumor, and the cyst enucleated.

The author believes that the choice of operation should depend upon the individual case. If the case belongs to the chronic group, and especially if there has been no serious general wasting, it would doubtless be more advisable and proper to remove the cyst altogether. If the case is very acute, the sooner the operation is completed the better. Even in this class of cases it might be advisable sometimes to remove the cyst, but as a routine practice, the author believes the less prolonged and simpler operation would be attended with a larger measure of success.

Stone in the Kidney.—LENNANDER (*Deut. med. Woch.*, Nos. 22 and 23, 1897) reports two particularly interesting cases of stone in the kidney which serve to illustrate the author's timely remarks upon the diagnosis and treatment of this condition.

Too frequently nephritic colic is the only symptom the general practitioner knows which would lead him to suspect the presence of a stone, yet, as has been pointed out by Rovsing, this should properly be called urethral colic, since it is produced by the passage of a foreign substance, not necessarily a kidney stone, through the ureter, and may occur in cases of tuberculosis of the ureter without the passage of an abnormal body. Such cases, of course, make one think of stone in the kidney, but they are not always associated with that condition.

Patients suffering from a pain localized in the lumbar region should always have their urine carefully examined. When a stone is present there are usually, but not always, traces of albumin and leucocytes present in the urine. Frequently blood can be seen with the microscope, or detected with the guaiacol test. After a careful and deep palpation of the kidney blood can usually be found in the urine; but even this may fail when the stone is firmly embedded in the parenchyma of the kidney. The substances to be looked for in the urine are albumin, red blood-corpuscles, and the so-called pelvic epithelium of the kidney.

The history of the case is of greater value. The family history should be studied for uric-acid diathesis or a previous history of various calculi in other members of the family. The pain experienced is then studied, ureteral colic is sought, then a fixed pain in the kidney region, which is increased by movements and shoots in varied and radiating directions—upward as well as downward into the leg and genital regions. Pressure, both anterior and posterior, over the kidney should produce pain. This often has the same character as that produced by motion. If the other symptoms of stone are present without this pain on pressure, there is the possibility, as Jordan Lloyd has pointed out, that the stone is impacted in the ureter. The ureter must then be carefully palpated, either through the abdomen, the rectum, or the vagina.

The determination of a stone in the ureter is an indication for immediate operation, as the sequelæ and the result of the stoppage of the urine are very serious, so far as the integrity of the kidney is concerned.

In the case of stone in the kidney, the indication for operation is less urgent. Since a nephrolithotomy in a non-suppurating kidney has a very favorable prognosis, it must be performed, especially in young or middle-aged persons, where there are no serious contraindications to a grave surgical interference. If suppuration is present at the same time, immediate interference is absolutely imperative. The longer the operation is delayed after the diagnosis is made, so much the worse is the prognosis.

The operation is performed by any of the usual lumbar incisions. The kidney is dissected from its surrounding fat and brought into the wound; the renal vessels are held with the fingers, or by forceps covered by drainage-tube. The kidney is carefully palpated, as is also its pelvis. If the stone is not detected by palpation, acupuncture is resorted to. When the stone is located an incision is made from the convex side of the kidney through the parenchyma down to the stone: if necessary, the kidney may be completely divided. After the removal of the stone the kidney is sewed with catgut sutures. The compression of the renal vessels is only necessary during the opening and removal of the stone, and should not be continued more than fifteen minutes. If the stone is so situated that it can be readily reached by an incision through the posterior wall of the pelvis, the author agrees that this would be better, as the bloodvessels do not have to be compressed. After the stone is removed and the pelvis carefully washed out and freed from all clot, the wound is closed by a continuous catgut suture. The wound is then drained by salol-gauze strips. This method places the patient in danger of the formation of a new stone in case a blood-clot remains in the pelvis of the kidney, but it does not risk a thrombosis of the renal veins or a loss of parenchymatous substance.

In all operations on the kidney there is danger of subsequent anuria. In order to minimize this danger the author advises the use of methods to increase the blood-pressure and decrease its density, and also to induce an acute hyperæmia in the sound kidney.

With this end in view he gives vigorous patients 800 to 1000 grammes of normal salt solution the evening before operation, injecting it subcutaneously, and an equal amount immediately after the operation, repeating the amount once or twice later, if necessary. Enemata of 400 to 500 grammes of a 9 per cent. salt solution, with 30 to 45 grammes of brandy, are given every three hours. As soon as the patient can retain it a milk diet is begun, with large amounts of water, care being taken to avoid the production of loose stools.

The opposite lumbar region is covered with a large warm poultice. If the pulse indicates it, subcutaneous injections of camphor are employed. Digitalin is used in minute doses hypodermically, not more than three-quarters to one milligramme being employed altogether.

The patient is carefully guarded from cold: the operation is performed upon a warm table, and the patient is put into a warm bed which is kept warm by warmed air from a spirit-lamp.

The author prefers a chloroform-ether narcosis, with ether as the principal constituent, since he believes that it has been proven that albumin-

uria and casts in the urine are more liable to follow chloroform than ether narcosis.

Beside the cases reported, the author has employed this method of after-treatment with success in a case of intermittent hydronephrosis with a movable kidney, and subchronic interstitial nephritis, in which he performed a plastic operation upon the ureter and pelvis of the kidney. Also in three severe nephrectomies, tubercular pyonephrosis in connection with stone, and a cancer of large size. The cases reported in detail are one of nephrolithiasis of obscure symptomatology, and probably congenital, the other a movable kidney, with catarrhal pyelitis and nephritis, from which he removed a large stone, and found an infection of pure coli bacilli.

Wound of the Superior Mesenteric Vein.—ROBSON (*British Medical Journal*, July 7, 1897) reports an interesting case of a young mechanic, aged twenty years, who was admitted into the hospital in a collapsed condition with all the signs of internal hemorrhage, pulse feeble, 190, temperature subnormal, skin pale, and covered with a cold, clammy perspiration. He was said to have vomited blood after the accident. He was found to be suffering from a penetrating wound of the abdomen, caused by the sharp end of a file without a handle, which, having caught in a revolving wheel of a lathe, was pushed through his clothes and abdomen. There was a small punctured wound a little above the umbilicus and almost in the middle line. The abdomen was nearly flat, with dulness in both flanks. Liver dulness was present, and there was resonance over the front of the abdomen.

The operation showed a profuse dark hemorrhage, but no injury of the viscera could be found. At the bottom of a deep wound posteriorly the superior mesenteric vein was found divided. The ends were ligated, the abdomen washed out with warm boric acid solution, drainage from the site of the wound, and then the abdomen closed. The patient made a good recovery. The escape of the viscera from puncture was noteworthy, and was probably due to the bluntness of the penetrating body. The hemorrhage into the stomach was due to a blow, but no puncture was discovered.

On the Immediate Reduction of the Angular Deformity of Spinal Caries.—JONES and TUBBY (*British Medical Journal*, August 7, 1897) have followed up the work of Calot and have performed forcible reduction in eleven cases. In six complete reduction was obtained, two with great facility. In five cases only partial reduction was obtained.

Of the results they say: In not one of the cases, despite the complete or partial reduction of the deformity, has there been either paresis or paralysis following the operation, nor has there been in four cases which have been carefully watched for two months any untoward signs, either of suppuration or a renewed outbreak of tubercle in those cases in which we presumed it to be the *fons et origo mali*. We submit, then, that, although the method is still on its trial as to its ultimate results, it seems to afford a good prospect of reducing the deformity without incurring dangerous consequences.

They infer that the correct way of preventing the deformity from arising or increasing in Pott's disease is to maintain the spine in hyper-extension by a suitable support beneath it, and not simply to place the patient upon a bed

or straight splint, which favors rugging of the spine at the seat of disease and increase of intervertebral pressure.

On Stone in the Bladder and Operations for its Relief.—In discussing the results which he has obtained in 133 operations for stone, CUNNINGHAM (*British Medical Journal*, August 7, 1897) says that not more than 3 per cent. of cases should be unsuitable for litholapaxy. The cases that are unsuitable he tabulates as follows:

1. Those with such condition of the passages that the lithotrite necessary for crushing the stone cannot be passed. In some children (seven reported cases) the urethra was too small.

2. The stone may be so large that the largest lithotrite will not lock on it; or it may be so hard that it will resist the greatest force that the instrument will bear or the operator be able to exert.

3. A stone in the bladder may be complicated with one or more in the membranous or prostatic portions of the urethra, which cannot be pushed back into the bladder; or the stone may be encysted, or may be complicated with a tumor of the bladder.

4. A state of affairs may exist that makes it desirable to establish complete drainage and rest the bladder after removal of the stone, such as extensive cystitis with ammoniacal urine, and especially if associated with stricture of the urethra.

5. Such a condition or irritability of the bladder that the organ will retain no fluids even under profound anæsthesia. The stone being clasped by its hypertrophied walls in this latter case, an expert might perform litholapaxy without increasing the patient's risk, but perineal lithotomy would have considerable advantages in such cases in allowing drainage and rest to the bladder.

Of the cutting operations, the author states most emphatically that he prefers the perineal method, and restricts the suprapubic to the following conditions: (*a*) exceptionally large calculi, and these would probably be better dealt with by perineal lithotrity; (*b*) encysted calculi; (*c*) and those associated with tumor of the bladder, which it is advisable to remove at the same time.

The Mechanical Treatment of Injured and Diseased Joints.—Taking as an example of an injury, the overstraining or spraining of a joint, KLEMM (*St. Peter. Med. Woch.*, 1897, No. 28) says that the extravasation of lymph and blood which takes place will be only partially absorbed if the joint is placed in absolute rest, while a part will become organized and will interfere with the action of the joint, which may finally become anchylosed, with wasting of the muscles. He calls attention to the fact that the extravasation takes place not alone into the joint, but the great intra-articular pressure also forces it out into the intermuscular spaces, where it later may become organized and interfere in this manner with the nutrition and function of the muscles and prevent motion in the joint.

Such a condition the author has observed and verified on post-mortem examination.

As treatment for these injuries he advocates massage with passive motion.

In contradistinction to certain authors he believes in commencing the massage immediately. The massage, beginning at the periphery and then extending to the joint, is not painful, and acts to remove the extravasated fluid which is the cause of the trouble. After the massage the joint is placed in a compressive cotton dressing, fixed upon a splint and placed in an elevated position. The massage is continued in daily sittings. After three or four days the splint is removed, and after the disappearance of the swelling passive motion is commenced, while the use of the joint is fully restored at the end of fourteen days. The time at which passive motion should be commenced is of great interest. It has for its purpose the prevention of atrophy in the soft structures of the joint and in the group of muscles which moves the limb. The elbow is a joint which is especially prone to these changes, and here the passive motion should be commenced on the third or fourth day. The author employs in giving the passive motions the Swedish method, where the patient offers a slight muscular resistance to the motion, believing that in this way the groups of muscles which are involved will better retain their strength. The application of cold is held to be of no value, or at least the anæsthetic effect is offset by the contraction of the capillaries, which prevents the absorption of the extravasation.

In cases complicated by fracture the author employs the same principle, and alternates with rest and fixation, passive motion and massage, which can be done if the fragments are kept in proper position by extension and counter-extension without injury, and in reality stimulate the reparative processes.

The author also finds massage of use in the treatment of various arthrites found in connection with infectious diseases, but applies it only in the acute stage and not to the resultant conditions of contraction and anchylosis.

In gonorrhœal arthritis and those forms of arthritis which occasionally appear in typhoid, measles, scarlet fever, smallpox, dysentery, and diphtheria, which are so varied in their nature and have the point of inception outside of the synovial membranes, the author would advise them to be let alone, and especially warns against massage in gonorrhœal arthritis, as it is liable to spread the infection and produce serious results.

He further advocates the use of massage in cases of arthritis due to fungoid tubercular granulations, but with special care in the differential diagnosis from the other forms—in chronic articular rheumatism, in deforming arthritis, as in arthritis deformans, tabes dorsalis, and syringomyelia; in acute diseases of the joints after the inflammatory process has subsided, with a view to preventing the later results of the disease upon the joint.

A Cheap and Serviceable Surgical Suture.—GUBAROFF (*Cent. für Chir.*, October 31, 1896) describes a new method for preparing ordinary linen thread for surgical use in such a manner that it does not kink, twist, or knot, and is readily rendered aseptic.

The thread is deprived of its fat by boiling in caustic soda, then washed in water and sterilized, and laid for a few days in alcohol. It is then placed in a 5 per cent. celloidin solution (Schering), with equal parts of alcohol and ether; from this solution it is laid out and allowed to dry while stretched. The threads contract and are shining, do not absorb water or twist, and may be readily threaded. The sutures may be sterilized, but cannot be kept

in alcohol, though they may be placed in bichloride or carbolic solutions. Sublimate 1 to 1000 may be added to the celloidin solution, making it antiseptic.

Hydrocele Bilocularis Intra-abdominalis.—VOLLBRECHT (*Arch. für klin. Chir.*, 1896, Band, lii Heft 2) describes an interesting case of this rare form of hydrocele. The swelling was pear-shaped, with the apex downward, and very large, extending from the bottom of the left scrotum to the height of the umbilicus and from the anterior superior iliac spine on the left to four-fingers' breadth beyond the median line on the right. It was dull on percussion, translucent, and fluctuating. A portion of the scrotal contents could be emptied by pressure into the abdominal portion. The line between the two tumors was formed by Poupart's ligament. The testicle was found below and posteriorly in the scrotum. There was present also a simple hydrocele of the tunica vaginalis testis on the right side.

The following operation was performed for the radical cure by PROF. MIKULICZ: An incision was made in the longitudinal axis of the tumor and three half-pints of fluid were withdrawn. The inguinal canal was found to be widely dilated, sufficiently so for the passage of two hands. An examination with the hand disclosed the fact that the wall of the sac was fibrous in character and very thick; the whole sac was lined with a serous membrane which was thickest in the intra-abdominal portion. The hand could reach nearly to the left kidney, but that organ could not be palpated on account of the thickened wall of the sac.

The serous lining was removed by blunt dissection and the sac closed. The enlarged inguinal canal was closed by Bassini's operation for radical cure of inguinal hernia. The wound closed after a little delay from serous discharge and the patient made a complete recovery.

From his study of this case and the literature of the subject, the author concludes that these hydroceles have their origin in the fact that the funicular portion of Giraldès's organ does not entirely disappear, and that this particular form of hydrocele results from an anomalous growth of that portion of this organ.

Coxalgia should be Cured without Leaving any Limp in Walking.—CALOT (*La Méd. mod.*, November 4, 1896), in speaking of the treatment of coxalgia, says that of cases seen in the primary stage, ninety-eight out of the hundred should be cured without leaving a limp behind. The limp is consecutive, and is caused by shortening, by weakness of the limb, and by absolute ankylosis. Shortening is due to three factors—a vicious position, the displacement of the head of the femur into the iliac fossa, and atrophy of the limb. The two former may be easily avoided if the case is seen early; an atrophy in length cannot be always avoided, but it is an important factor, and does not need to be very great in order to produce shortening of itself. The weakness of the limb may be overcome by giving up splints and fixation as soon as possible, and beginning gymnastics, massage, and electrolysis. Ankylosis or extreme mobility the surgeon is responsible for. Ankylosis is extremely rare, and when it does occur may be overcome by special teaching, so that the patient is enabled to walk without limping.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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Inequality of the Pupils in Health and Disease.—FRÄNKEL (Lyons) divides anisocoria into organic, functional, and physiological. Organic inequality is the expression of a direct or indirect lesion either of the third nerve or of the sympathetic. Functional inequality depends upon some indirect action upon the sympathetic; the third nerve is supposed never to be involved in this form. Certain rare phenomena, however, especially observed in hysteria justify the view that pupillary disturbances due to spasm or paralysis of the constrictor nerve do not necessarily imply an organic lesion, but may be functional. Physiological inequality is congenital, and not dependent upon any known condition. Organic anisocoria is due to a lesion situated within the eye, orbit, cranium, spinal canal, or elsewhere—*i. e.*, at the anterior roots of the eighth cervical, first or second dorsal, rami communicantes, the inferior portion of the brachial plexus or the cervical sympathetic, etc. Moreover, in traumatisms or tumors directly affecting any point in the course of the pupillary fibres, inequality of the pupils is frequently observed from an influence exerted upon the sympathetic, and similarly in affections of the circulatory, lymphatic, and respiratory apparatus.

Functional inequality is practically always due to irritation of the sympathetic—*i. e.*, to a unilateral spasmodic mydriasis.

The pupils are unequal in many unilateral affections of the trunk or limbs, the larger belonging to the affected side. The inequality is only evident, as a rule, when the pupils are dilated and disappears when they contract.—*La Presse Médicale*, 1897, No. 77.

Exophthalmic Goitre.—J. A. SPALDING (Portland, Me.) reports a case in which, owing to excessive protrusion of the globes, the enucleation of both eyes became successively necessary after they had been functionally destroyed by panophthalmitis.

The patient was a man, aged thirty years, who first had blurring of sight in the right eye and paralysis of the right internus. Exophthalmos came on a few weeks later, and after that enlargement of the right thyroid, and increased heart action. The protrusion of the eye increased until the lids could not be closed over it, and inflammation of the cornea and deeper structures followed. After removal of the globe there remained enormous pro-

trusion of the orbital tissues; a hard brawny tissue still continued to fill the orbit. A few months later the second eye became similarly affected, and was lost in the same way. The general condition of the patient improved and the thyroid swelling diminished under use of thyroid extract.

W. F. AIKEN (Savannah) reports a case of exophthalmic goitre following ether anæsthesia. Marked prominence of the eyeballs was observed about the time that consciousness was abolished, and this remained, with other characteristic symptoms of the disease, when the patient was seen nine months later. High hyperopia with astigmatism was corrected, and although no medical treatment seemed to benefit her perceptibly, she gradually improved until, after six or seven years, she was quite well. A hemorrhage occurring in the fourth ventricle is suggested as the probable cause of the attack.—*Transactions of American Ophthalmological Society*, 1897.

The Mechanism of Accommodation.—The question of the mechanism of the accommodation is again being actively discussed and ingenious experiments have been devised for its solution. There are two theories. First, Helmholtz's well-known view is that the contraction of the ciliary muscle relaxes the zonula, permitting the lens to become more convex by virtue of its own elasticity. The second theory especially maintained by Schön and Tscherning ascribes the same result on the lens to a directly opposite effect of the ciliary muscle on the zonula, holding that it exercises traction upon the zonula which, indeed, serves it for a tendon of attachment. The zonula is thus rendered tense and the equator of the lens drawn backward. Now, inasmuch as the vitreous plays the part of an elastic cushion or fulcrum, the lens being pushed against it becomes curved, just as a stick when bent over the knee. The centre of the anterior surface of the lens becomes more convex than the peripheral portion—*i. e.*, the edge is left or rendered hyperopic relatively to the centre.

That this change is a fact, independent of theory, is admittedly proved by Tscherning's optometric and phakoscopic examinations. But this does not necessarily prove the truth of the tension theory. It is also consistent with the Helmholtz view, especially if it be remembered that the lens is not homogeneous, but that it possesses at its centre a differentiated nucleus—*i. e.*, the hypothesis does not require the anterior surface of the lens to become exactly spherical.

But that relaxation of the zonula actually does take place with accommodation is proved by the "accommodative iridodonesis," by subjective (entoptic) phenomena, and by objective measurements. Moreover, the same has been shown anatomically by microscopic examinations of the contracted ciliary muscles in birds. Entoptic examination of the spectrum of the lens shows several punctate opacities. Hess observed that these opacities were shifted uniformly during accommodation. The cause of this is a falling of the lens in consequence of relaxation of the zonula continuing after the lens has reached its maximum of curvature. In different positions of the head the entoptic appearances always corresponded to such falling of the lens. This is inconsistent with the tension theory.

Again, if two threads are stretched in a horizontal plane, one at the distance of the punctum proximum, the other at one metre, the gravitation of

the lens during accommodation should affect the image of the nearer thread upon the retina more than the farther, on account of parallax; and this is found to be the case. When the accommodation is relaxed the images of the two threads coincide; during accommodation they separate, the amount of separation being a measure of the movement of the lens. Such movement has been found to correspond to one-half millimetre in natural accommodation and one millimetre after instillation of eserin.

Finally, the movement of the lens has been objectively measured by examination of the reflexes and found to agree with the subjective determinations.

By the instillation of atropin and eserin into the eyes of birds it is possible to fix the ciliary muscle in a condition of paralysis or spasm. Microscopic examination of such eyes leaves no doubt that contraction of the muscle results in relaxation of the zonula.—L. HEINE, in *Fortschritte der Medicin*, 1897, No. 23.

Electrolysis for Trachoma.—S. SNELL (Sheffield) has found this method of benefit in chronic cases, although he offers it as an alternative more than as a substitute for other methods. The negative pole is applied to the cheek and the positive to the everted surface of the lid; the latter has a curved, flattened platinum electrode which is passed over the conjunctival surface. The strength of the current used is seldom more than 3 milliampères and should not exceed 5 milliampères. A whitish, frothy trail follows the platinum point. In spite of cocain the application is painful, but the pain soon ceases. It may be repeated every few days.—*Ophthalmic Review*, 1897, page 202.

Chronic Membranous Conjunctivitis.—H. HARLAN (Baltimore) reports a case in a girl, aged ten years, in whose left eye there was a growth from under the upper lid, fibrous in character and extending over most of the lid, consisting of an organized membrane, thick, yellowish-white, easily detached, but leaving a bleeding surface behind. It had all the macroscopic appearances of diphtheritic membrane as seen in the throat, but no diphtheria bacilli were found.

The history was that the eye had been about the same for six years under the care of a number of physicians. The cornea had sloughed years before. Powdered jequirity dusted over the lid provoked a violent inflammation, with great swelling of the lids, some fever, and three days later sore-throat, with the formation of patches on the tonsil and fauces and the appearance of diphtheria bacilli in this membrane. Under antitoxin she promptly recovered from the acute trouble, but the chronic membrane continued.—*Journal of Eye, Ear, and Throat Diseases*, October, 1897.

L. HOWE (Buffalo) exhibited before the American Ophthalmological Society a similar case in a boy, aged eight years, in whom the membrane had lasted for eighteen months, unaffected by treatment. The sight remained good. A sister of this boy had been similarly affected. Each of them had an acute exacerbation, and at that time the sister's eye was lost. Repeated bacteriological examinations had failed to show diphtheria bacilli, except during the acute trouble, when the throat was affected and the bacilli were

found in the ocular secretion. At the time of the boy's acute attack two children that had been in the same ward developed diphtheria and died.—*Transactions American Ophthalmological Society*, 1897.

[Cases of chronic membranous conjunctivitis have been previously reported, but the striking features of this group are, that in each case one eye remained normal, and the development of the acute diphtheria in the course of the disease, with the absence of diphtheria bacilli at other times.

The cases so far reported are not numerous enough to serve as a basis for conclusions, but it is greatly to be hoped that all similar cases will be carefully studied and reported.—ED.]

Insertion of an Artificial Globe in Tenon's Capsule.—H. MCI. MORTON (Minneapolis) suggests that when the retention of the sclera for the insertion of a glass globe is impossible, the globe should be inserted into the capsule of Tenon. To do this, as each of the tendons of the recti muscles is dissected from the globe, a double-needle catgut suture is inserted in it from within outward, enclosing the central portion of the tendon, and tied on its external surface. After all hemorrhage is stopped a glass sphere is placed in the cavity and the sutures from the opposing recti muscles are tied over it, in such a way that the slipping of any one suture will not allow displacement of the others or release the globe. The catgut sutures are then cut off and the conjunctiva is carefully closed over them. In one case in which this operation was done there was no subsequent pain or elevation of temperature, and a support was obtained for the artificial eye equal to that secured by the Mules operation in favorable cases.—*New York Medical Journal*, October 30, 1897.

Treatment of Trachoma.—KUHNT (Konigsberg) differentiates trachoma from follicular conjunctivitis, and sums up the treatment of the former as follows: 1. Palpebral spasm, blepharophimosis, disease of the lachrymal sac or faulty position of the cilia occurring as complications are, if possible, to be relieved prior to other treatment. 2. The treatment is to be determined with reference not only to the stage and special form of the given case, but also with regard to external and individual conditions. 3. Of greatest importance, next to the choice of treatment, is the circumstance whether the patient dwells in an immune or an infected locality, and whether, in the latter case, after recovery he is compelled to return thither. 4. Medical treatment (by copper sulphate) alone is suitable only for light cases in immune or almost immune localities. 5. In cases of greater severity procedures looking to the destruction of the (*a*) individual granulations (*e. g.*, galvano-cautery) and (*b*) mechanical and operative measures must be employed. 6. The most effective mechanical methods are expression and rolling. 7. In cases of swelling or infiltration of the tarsus, extensive puncturing of this structure should precede expression and rolling. 8. In pandemically infected regions, relapses or reinfections frequently and quickly follow treatment by expression and rolling. 9. No ill effects are observed after surgical intervention (excision of the fornix, or fornix and portion of the tarsus), provided such is properly carried out in suitable cases. In the severely infected districts of East Prussia surgical procedures have alone

proved adequate to bring about permanent cure. 10. In most cases medical treatment should supplement surgical measures.—*Deutsche med. Wochenschrift*, jahrg. xxiii., No. 38.

Congenital Ankyloblepharon.—BRUNZEL (Prague) describes a case, the second on record, of congenital union of the upper and lower eyelids by means of a fibrous band of the thickness of ordinary twine, situated at the junction of the inner and middle thirds of the commissure; its somewhat widened ends were inserted into the epithelium of the free margins of the lid. The band consisted of stratified epithelium, probably the remains of the epithelial tissue uniting the lids during a part of fœtal life.—*Prag med. Wochenschrift*, jahrg. xxii., No. 37.

Ophthalmia Nodosa.—GEO. KNAPP (Vincennes, Ind.) reports three cases of this rather rare disease. The first was in a young farmer, who, while climbing a tree, was struck in the eye by a falling body which he believed to have been a caterpillar. At once there were intense itching, burning, and smarting, followed by great swelling of the lids and conjunctiva and haziness of the cornea. In one week the eye was about normal. But the patient returned after three months, having suffered repeated attacks of acute inflammation. There were now present one reddish-gray nodule on the iris and three dark gray nodules in the episcleral tissue. These nodules were excised and hardened in Müller's fluid, and were found to contain fragments of caterpillar hairs.

In the second case the patient was treated for catarrhal conjunctivitis, but the inflammation continued, and three small nodules developed in the conjunctiva. The removal of these nodules, which contained fragments of hairs, brought about recovery.

The third case was that of a young lady struck in the eye by a caterpillar. There were burning, itching, pain, and photophobia. At the first examination no hairs were discovered, but four days after the injury two caterpillar-hairs were found in the cornea and four in the ocular conjunctiva. These were scraped away, and recovery followed.—*American Journal of Ophthalmology*, August, 1897.

Scopolamine as a Cycloplegic.—T. E. MURRELL (Denver) finds scopolamine hydrobromate is the most positive and prompt cycloplegic we have. It should not be used in a stronger solution than the $\frac{1}{10}$ of 1 per cent. Two instillations are sufficient for the most thorough suspension of the accommodation. It is free, in this strength, from the danger of increased tension, and causes no redness of the conjunctiva nor engorgement of the choroid, and no unpleasant symptoms other than those due to its physiological action on the eye. It is convenient to use, reliable in its results, safe, keeps well, and possesses fewer objectionable characteristics than any other known cycloplegic.—*Archives of Ophthalmology*, 1897, p. 335.

Holocain as a Local Anæsthetic.—H. V. WURDEMANN and N. M. BLACK (Milwaukee) report their experience with this new local anæsthetic in ophthalmic work. It is but feebly soluble in cold water, and the 1 per

cent. solution was employed. Such a solution is bactericidal and does not require sterilizing by heat. The instillation causes slight smarting, which lasts about thirty seconds, by which time anæsthesia is produced and continues for ten minutes and upward.

The advantages of the anæsthetic are its non-toxic action in local use, the stability and bactericidal quality of its solutions, the rapidity and completeness with which it produces anæsthesia, the length of time the anæsthesia lasts, the non-dilatation of the pupil, making it useful to instil before irritating applications, as no unpleasant blurring of vision is noticed afterward.

The only toxic effects that have been observed were in its use hypodermatically, it producing clonic spasms like those of strychnia when injected under the skin of animals.—*Ophthalmic Record*, October, 1897.

F. C. Hotz (Chicago) found the instillation of holocain always caused more or less smarting and burning, which, however, lasted but about half a minute; it also produced considerable redness of the conjunctiva (palpebral and ocular), which persisted during the whole period of anæsthesia. Within one and one-half to two minutes complete anæsthesia of the cornea was noted; after six minutes the sensibility of the cornea began to return, but a second instillation prolonged the anæsthesia for another five minutes; and if another drop was instilled the anæsthesia could be continued. It would seem that the anæsthetic effect of holocain can be kept up indefinitely by repeating the instillation every five minutes.

Holocain does not contract the conjunctival bloodvessels, and therefore causes neither bleaching of the eye, nor lessening of the lachrymal secretion, nor drying of the corneal epithelium. It does not dilate the pupil and has no effect upon the accommodation. On account of these qualities one would naturally feel inclined to use this new anæsthetic in preference to cocain in all operations on the eye. But a series of comparative tests of the efficiency of the two remedies seemed to show that the anæsthetizing effect of cocain (2 per cent.) is more thoroughly penetrating than that of holocain (1 per cent.).

It is therefore a very useful local anæsthetic for the removal of foreign bodies from the cornea and for operations upon the conjunctiva; but for deeper operations, and especially for those which involve the opening of the globe (iridectomy and cataract extraction) he regards cocain as the more reliable anæsthetic.—*Journal of American Medical Association*, Nov. 13, 1897.

[Holocain differs from cocain, then, in being more brief in its action and in not dilating the pupil or contracting the bloodvessels. It will probably share with cocain in ophthalmic work, these differences fitting the one to certain uses and unfitting it for others. Thus, for some operations, the power of cocain to prevent hemorrhage is only second in value to its power to prevent pain.—Ed.]

Exophthalmos Due to Cyst in Nasal Cavity.—H. Strachan (Kingston, Jamaica) reports the case of a boy suffering from left exophthalmos, and the inner wall of the orbit encroaching on the orbital cavity. No symptoms of nasal disturbance had been complained of, but on examination there was found some obstruction to the passage of a forcibly expelled or inhaled air-current, through the left nostril; and a tumor was found, high up at the pos-

terior part of the left nasal cavity, pressing on the inner orbital wall. This, on removal, proved to be a cyst containing about one ounce of mucoid material. After the operation the proptosis gradually subsided, and in ten days or a fortnight the condition of the left eye was normal.—*Universal Med. Jour.*, 1897, page 170.

DERMATOLOGY.

UNDER THE CHARGE OF

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Toxins in Dermatology.—HALLOPEAU (*Annales de Dermotologie et de Syphiligraphie*, 1897, Nos. 8 and 9), in a paper presented at the Twelfth International Medical Congress, discusses the rôle which toxins play in the production of diseases of the skin. These may be divided into exogenous, endogenous, and those of mixed origin. Exogenous toxins, or *toxexogenes*, as the author prefers to call them, may be of animal or vegetable origin. Toxexogenes of animal origin produce erythema, œdema, vesication, suppuration, and sphacelus; and in certain cases, as in the slate-colored patches in phthiriasis, eruptions of a special character. The polymorphous eruptions of scabies, and particularly the intense pruritus, are probably due to toxins secreted by the acarus. Dermatoses due to the ingestion of animal toxexogenes are observed more rarely; as an example of this form of dermatosis, urticaria following the ingestion of certain mollusks may be mentioned, and, perhaps, certain eczematous outbreaks. Among toxexogenes injections of serum should be included; the eruptions thus produced may be urticarial, morbilliform, or scarlatiniform. Toxexogenes of vegetable origin may act directly upon the skin or, after absorption, through the blood. These produce erythema, urticaria, vesicles, pustules, bullæ, ecchymoses, eschars. They are the result of disturbances in vascular and trophic innervation produced by the action of toxins on the peripheral centres of innervation. Among vegetables which produce toxins pathogenic to the skin special mention should be made of the fungi concerned in the production of ringworm.

Sabouraud attributes to the toxin produced by the bacillus found in seborrhœa of the scalp the production of pelade. Among fungi whose secretions are hurtful are those of actinomycosis and Madura foot.

Among endogenous toxins one may distinguish several categories. Such toxins may be the result of the functions of the cells; they are then normal products which become hurtful through their production in exaggerated quantity, or their alteration under the influence of a hereditary or acquired

predisposition, or by transient or permanent alteration of the fluids of the body. The resorption of products of excretion, either because of their excess or obstacles to their elimination, as well as alterations in their composition, may cause autointoxications which react upon the integument.

Toxins produced by microbic activity may be regarded as of mixed origin, the microbes acting in this respect like living cells of the organism. Dermatoses connected with the action of microbic toxins may remain limited to the immediate neighborhood of the microbic focus; others may extend centrifugally. Streptococci have a particular tendency to slowly propagate themselves, producing by their toxins special phlegmasias. Other microbes, after being at first localized, give rise secondarily to phenomena of infection which may be either local or become general; no pathogenic microbes are then found, the phenomena being due to the resorption of toxins. Lastly, attention is called to the infections which may arise from the toxins of tuberculosis, glanders, and leprosy.

Malignant Papillary Dermatitis.—F. H. WIGGIN and J. A. FORDYCE (*New York Medical Journal*, October 2, 1897) report a typical case (with colored picture) occurring in a woman, aged fifty years. The disease began on the nipple of her breast five years before coming under observation, and seven years after the birth of her last child. It was a "small sore" at first; grew gradually, and discharged at intervals a clear, viscid fluid. There were occasional burning and tingling, but no pain. At the end of the five years of its duration it existed as an inflamed area two by three inches in extent, in the centre of which the nipple was so retracted as to be hardly perceptible. It had a sharply-defined border, and its surface presented a granular surface and a bright-red color, slightly streaked with white. The underlying tissues were infiltrated, but no tumor could be felt in the breast. The breast was excised and the growth examined by Dr. Fordyce (a number of good photomicrographs accompany the article). The morbid changes found in this disease may be briefly described as an inflammation of the papillary layer of the skin, leading to an œdema and vacuolation of the constituent cells of the epidermis, followed by their complete destruction in some places and their abnormal proliferation in others. The change in the epithelium of the lactiferous canals and glandular epithelium, which is also of a proliferative and degenerative nature, is secondary to the change in the surface epithelium. The over-distention of the lactiferous canals by the proliferating epithelium, resulting in a malignant infection of the surrounding connective tissue, is the usual termination of the disease, as in the case reported. The chief point of interest in the case was the length of time the disease had existed prior to malignant infection—nearly five years. As is now well known, the disease is particularly liable to be confounded with chronic eczema until the breast itself becomes involved.

The Treatment of Psoriasis.—NORMAN WALKER (*Quarterly Medical Journal*, July, 1897) states that for the scalp, if there is much inflammation, the local treatment may be begun with weak ammoniated mercury ointment, five grains to the ounce, the strength being increased by degrees. Sulphur and salicylic acid are of great value, more suitable when the irritation

is not so severe. They should be used from ten to thirty grains to the ounce, either together or separately. For the disease involving the general surface, bathing in warm water is well spoken of, followed by (where the patches are few and not inflamed) chrysarobin in liquor guttæ-perchæ or tar in collodion, twenty grains to the ounce. Unna's compound chrysarobin ointment is praised. It consists of chrysarobin, 5 parts; salicylic acid, 2 parts; ichthyol, 3 parts; petrolatum, 90 parts. The four internal remedies recommended as being the most valuable are arsenic, potassium iodide, sodium salicylate, and thyroid gland. Caution is given against employing the last-named. It should be reserved for grave cases, and should be used with caution.

Results in Lupus with Koch's New Tuberculin.—O. LASSAR (*Dermatologische Zeitschrift*, 1897, Bd. iv.) treated five cases of lupus vulgaris which were probably benefited by this mode of treatment. The injections were borne without any local reaction. The writer recommends further trial of the remedy, justified by the results obtained thus far.

Tuberculous Lesions in Erythematous Lupus.—AUDRY (*Annales de Dermatologie et de Syphiligraphie*, 1897, No. 5) reports a second case of erythematous lupus in which lesions presenting the histological features of tubercle were found. The case was one of erythematous lupus of the face, perfectly typical in character, observed in a young woman, twenty-seven years of age. The lesions found were quite characteristic, anatomically, of tubercle, but were few in number, it being necessary to examine a large number of sections to find them. Tubercle bacilli were sought for without success. In spite of the absence of bacilli the reporter believes the case to be new proof of the tuberculous nature of ordinary erythematous lupus.

Trophoneurotic Eruption of the Extremities Resembling Dermatitis Repens.—FRÈCHE (*Annales de Dermatologie et de Syphiligraphie*, 1897, No. 5), at a séance of the Société Française de Dermatologie et de Syphiligraphie, reported a case of disease of the hands recalling the *dermatitis repens* of Crocker. The patient was a man, forty-two years of age, apparently in good health, who for eight months had suffered from an affection which had commenced upon the right thumb as a brownish spot upon the nail, without apparent cause. A few days later the skin about the insertion of the nail became red and swollen, pus formed beneath the nail, loosening it and the surrounding epidermis. The disease spread gradually to the palm, invading the entire thenar eminence. Other nails became diseased at short intervals, first the little finger, then the index, the ring-finger, and lastly the middle finger. Some time after, similar lesions appeared upon the left hand. At time of reporting the case the entire palm of the right hand and the fingers were deprived of epidermis, forming a large excoriated plaque. The skin was deep red, smooth, and sprinkled with flat miliary pustules filled with thick yellow pus, and oozing abundantly. The lesion was sharply defined, being surrounded by a well-marked border of loosened and macerated epidermis some millimetres in width. Upon the dorsal surface of the hand the patches only extended about one and a half centimetres beyond the nail-folds, which were swollen and painful, and of a bright-red color. All the

nails of the right hand had fallen, and flexion of the fingers was difficult and painful.

Lupus Vulgaris Treated by Means of the Roentgen Rays.—SCHIFF (*Archiv für Dermatologie und Syphilis*, Bd. xl., Heft 2 and 3) reported at a session of the Vienna Dermatological Association two cases of lupus vulgaris treated by means of the cathode-ray, with noteworthy result. The first case was a fourteen-year-old girl who had had a lupus of the skin of the left forearm since the age of three. In 1891 she had been treated in Billroth's clinic with Koch's tuberculin, without result. The diseased parts were exposed to the rays daily for two hours at a time. On the tenth day the first reaction appeared; the exposed parts became red and swollen, especially about the lupous infiltrate, an abundant secretion trickling out from beneath the crusts. In the following days the crusts fell off spontaneously, and the diseased parts appeared as shallow, indolent, sharply-limited ulcerated surfaces surrounded by a rosy halo. Under continuance of the treatment the ulcers became clean and granulating, pin-head sized, wart-like structures appearing upon the bottom. At the height of the reaction—upon the nineteenth day—the treatment was interrupted. Upon the following days the above-mentioned wart-like structures fell out, leaving sharp-cut losses of substance as if made with a punch. The lupous nodules scattered about in the cicatrices upon the forearm showed a rosy areola similar to the ulcerating lesions; they became swollen, and nodules became visible where none had been noticed previous to exposure to the rays. Some days later the epidermis of the hand and forearm came off, and the nodules fell out. Cicatrization now began and proceeded in the beginning in a normal manner, but later proceeded much more slowly, so that at the end of two months and a half it was not yet completed. On the flexor side of the forearm, where the rays were prevented from reaching the skin by the bones, the lupous infiltrate remained unchanged. The second case, one of lupus in the region of the larynx, reacted in the same manner as the first.

Seborrhœic Eczema upon a Cicatrix.—AUDRY (*Annales de Dermatologie et de Syphiligraphie*, 1897, No. 5), at a meeting of the Société Française de Dermatologie et de Syphiligraphie, reported a case of so-called seborrhœic eczema occurring in a young man, twenty-three years of age, upon a cicatrix the result of a burn in infancy. The occurrence of this disease upon a surface where the sebaceous and sudoriparous glands had been destroyed for years is held by the author to be strongly corroborative of the opinion, which he had previously maintained, that the affection known as seborrhœic eczema is neither a seborrhœa nor an eczema. As the result of experiments made with this case, he concludes that so-called seborrhœic eczema is auto-inoculable.

Lepra in Holland and Her Colonies.—T. B. VAN DORT (*Dermatologische Zeitschrift*, 1897, Bd. iv.) states that Holland contains about thirty lepers, all of these cases having contracted the disease in the colonies. In the West Indies, at the leper asylum of Curaçoa, there were nineteen lepers in 1896, while on the islands of St. Eustasius and St. Martin, there were seventeen lepers among 5900 inhabitants.

OBSTETRICS.

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Pregnancy Complicated with Chorea.—In the *Practitioner*, December, 1897, DAKIN reports seven cases of pregnancy complicated by chorea. While this disease is not common among pregnant women, it is a grave complication when present, and is itself modified by the fact that pregnancy exists. It is much more fatal in pregnant than in non-pregnant women. This is not the case with epilepsy and with some other neuroses, including migraine, for they are less frequent in pregnancy. Another complication which renders cases of chorea in pregnant women especially grave is the fact that mania is so often present in these patients. This results in profound exhaustion, and greatly lessens the probability of recovering.

The first of Dakin's cases was a young woman of good previous history who had borne one child. Since becoming the second time pregnant she frequently fainted, at times could not speak plainly, was maniacal, and had spasms of the left side of the body. These spasms became general, and the patient was delirious at night. She could not be fed, and the sphincters were relaxed. Her temperature was 105° F., and her mania became violent. Although labor was induced, she died before it could terminate. At the time of death her temperature rose to 110° F. Autopsy showed cloudy swelling of the heart-muscle, vegetations on the mitral valve, and cloudy swelling of the other organs.

Case second was four and a half months pregnant and had chorea when seventeen years old. She was delirious at times, and her movements were almost incessant. Although she responded at first to treatment, she died with high temperature, before the uterus could be emptied.

Case third was six weeks pregnant, and made a tedious recovery after the uterus was emptied under an anæsthetic. Morphine entirely failed to control her movements, while hyoscin was successful. Her temperature was normal throughout, with one slight exception.

The *fourth* patient was six months pregnant when chorea began. She was under treatment until her mind became affected, when she was brought to the hospita'. Labor was induced and a living child delivered, which survived. The mother made a tedious recovery.

In the *fifth* patient the chorea began at the sixth month of pregnancy, and the patient recovered when labor was induced. The child did not survive.

Case sixth was in her fifth pregnancy at the second month, and left the hospital against advice, because her illness was not severe. She was not improved by rest in bed and by arsenic.

The *seventh case* was a very mild one in which chorea appeared in the second month of pregnancy, the patient recovering under arsenic and bromides without the induction of labor.

From these cases the conclusions are drawn that chorea is most frequent in first pregnancies and in young women. It usually appears during the first six months, the worst cases occurring at the second, third, and fifth months. A mitral murmur was present in all cases. When labor is induced the choreic movements commonly cease. Treatment by drugs is useless, unless the case is a very mild one. After delivery hyoscin used hypodermatically is more efficient than morphine. All fatal cases had high fever. The prognosis in any case seems to depend on its severity within the first week or two of the spasms. Mania is a very dangerous symptom, and the induction of labor or abortion must be undertaken at once when the patient's mind begins to wander. If the spasms are severe enough to keep the patient awake at night, labor must always be induced. This should be done under an anæsthetic.

In severe cases the temperature may rise very suddenly, and hence it should be taken every hour, that efficient treatment may be begun so soon as high fever occurs. If the temperature rises above 100° F., measures should be taken to reduce it.

Transverse Incision of the Fundus in Cæsarean Section.—In the *Wiener klinische Wochen.*, 1897, No. 49, KNAUER reports, from Chrobak's clinic in Vienna, two cases of Cæsarean section in which transverse incision of the fundus was practised. Fritsch has claimed for this method the following advantages: First, the incision is made higher in the abdomen than by the other methods, so that the scar comes in the umbilical region, making the liability to hernia much less. Second, during the operation the abdominal walls are easily kept in apposition, the uterus is readily compressed, and blood does not easily enter the abdominal cavity. Third, the bleeding is very slight, and the stitches readily close the vessels. Fourth, the legs of the child present so soon as the uterus is opened, and the child is quickly extracted. Fifth, the wound rapidly grows less in size so soon as the uterus is opened. Sixth, the uterine wound, after the operation, is contained in the pelvis in its greatest extent.

The case described by the writer was that of a woman, aged twenty-six years and near the end of the first pregnancy. She had already had severe pains. On examination she was found to have a rhachitic, highly contracted pelvis, whose true conjugate was 8 cm. Cæsarean section was performed and the uterus opened by a transverse incision across the fundus. The breech of the child immediately presented, and the fœtus was quickly extracted. It immediately cried and the cord was tied. The placenta and membranes were readily removed. The uterus at the fundus was but a finger's-breadth in thickness. There was but little bleeding, which ceased entirely when the sutures were applied. The uterus was closed with seven deep-buried sutures and a row of fine silk sutures closing the serous surfaces. At first the womb contracted poorly, and two injections of ergotine were given and the uterus was rubbed on its anterior and posterior wall. No compression was made upon the broad ligaments. The uterus finally con-

tracted well and was replaced in the abdomen, and the abdominal wall closed in the usual manner. Mother and child made an excellent recovery.

Especially remarkable in this case was the rapid contraction of the wound after the uterus was emptied. The seven stitches which closed it were placed very close together throughout its extent. After the uterus was emptied the incision was about 8 cm. in length.

In addition to this case a second is reported in which Cæsarean section was performed upon a woman who had cancer of the uterus too extensive to permit removal. The uterus was opened by the transverse incision, and the child quickly extracted. The amniotic liquid had been drained away for some time, and when the uterus was opened an arm presented in the wound. The same lack of hemorrhage was observed, and the extraction of the child was most successful.

The case was terminated by amputation of the uterus.

The Origin of General Dropsy in the Newborn.—AUDEBERT (*Revue Mensuelle des Maladies de l'Enfance*, December, 1897) reviews the literature upon this subject and finds that the cases reported have been associated with polyhydramnios, and less often with syphilis. Albuminuria was present in a small proportion of the mothers.

The writer's case was that of a child born in the mother's first pregnancy in spontaneous labor. The size of the fœtus seemed during labor to be excessive, when the mother had strong pains, and succeeded in expelling the child. It survived but a few minutes, although the cord was beating at its birth. An examination of the child showed a large quantity of yellowish serum in the abdomen. The peritoneum was pale, the liver, spleen, and kidneys normal, and the mesenteric glands were not enlarged. There was also fluid in the pleural and pericardial sacs. The placenta was larger than normal and seemed made of very large cotyledons. The placenta resembled somewhat a syphilitic placenta. On inquiring concerning the family history, it was found that the father of the child had once had syphilis. An idea of the weight of the placenta may be obtained by referring to the fact that ordinarily the weight of the placenta is about one-sixth that of the child. The syphilitic placenta, however, is often one-fourth that of the infant.

[In a case of extreme polyhydramnios we had occasion to observe an infant in whom general dropsy was exceedingly well marked. All the serous cavities of the body contained fluid, while the cellular tissue was also dropsical. In this case the child could not be made to breathe, although its heart-beat persisted for some time after birth. The heart-action was especially slow and labored.—ED.]

The Treatment of Pregnancy and Labor Complicated by Cancer of the Cervix Uteri.—In the *Münchener medicinische Wochenschrift*, 1897, No. 47, FEHLING contributes a paper upon this subject. Regarding the frequency of cancer during pregnancy, Fehling has observed five cases in 3000 births. It is much less common than myoma in pregnancy.

As regards treatment, he advises extirpation through the vagina in the

early months of pregnancy. In the later months he would perform Cæsarean operation, remove the child, amputate the uterus, and remove the cervix through the vagina. The total extirpations of the uterus following abdominal incision have not in his experience been successful.

When the cancer is so far advanced that it cannot be removed, Cæsarean section should be performed in the interest of the child only. He reports the following cases:

The first was that of a patient in the early months of pregnancy, in whom the uterus was extirpated through the vagina. A speedy recovery followed.

The second was that of a patient at term in whom cancer of the cervix had proceeded extensively. The child was delivered by abdominal section, followed by a Porro amputation of the uterus. The mother died of cancer about a year afterward.

His third case was six months pregnant, the cervix being infiltrated with malignant growth. A Porro operation was performed, the child perishing. After the amputation of the uterus the cervix was brought out through the vagina and removed, and the peritoneum closed over the vaginal opening. The patient made a good recovery.

His fourth case was that of a multipara with cancer of the cervix, upon whom a Porro operation was performed. The child died soon after birth. The patient's recovery was complicated by an abdominal fistula.

His fifth case was a multipara with cancer of the cervix, who had recently borne a child. The empty uterus was removed through the vagina. The patient became infected, and was ill for three weeks with pleuro-pneumonia, from which she finally recovered.

In the *Centralblatt für Gynäkologie*, 1897, No. 47, RECKMANN reports the case of a multipara who had been greatly weakened by repeated hemorrhages from the uterus. She was six months advanced, and on examination was found to have cancer of the cervix.

The first step in the operation consisted of a thorough curetting and cauterizing of the cervix. The broad ligaments were then ligated with catgut. The uterus was drawn down and the cervix incised so as to split the uterus. The fœtus and its appendages were then removed. The uterus was then retroverted and removed in the usual manner. The patient made a good recovery.

Rupture of the Uterus During Pregnancy.—JELLINGHAUS (*Archiv für Gynäkologie*, 1897, Band liv., Heft 1) reports an interesting case of a woman who had been pregnant eight times, and in each labor had suffered from bleeding from adherent placenta, which required manual removal. She was in the sixth month of her pregnancy and came to the clinic because she had bleeding and pain. She gave a history of having worked hard and sustained a fall from a window. Her miscarriage proceeded slowly, and she was given a laxative to move the bowels. She had six thin movements, and when next examined it was noticed that the uterus was tense and the abdomen slightly distended. There was dulness in the lower portion of the abdomen. This dulness gradually increased; the abdomen was painful and greatly distended. Abdominal section was performed, when it was found that the

uterus had ruptured; the child was at once removed. A Porro amputation of the uterus completed the operation. The patient made a tedious recovery.

The walls of the uterus in this case were excessively thin, and the womb had undoubtedly been weakened by repeated pregnancies and the manual removal of the placenta.

The Bacterium Coli Commune Complicating Labor.—GEBHARD (*Zeitschrift für Geburtshülfe und Gynäkologie*, 1897, Band xxxvii., Heft 1) reports two cases dying of puerperal sepsis in whom this germ had occasioned the formation of a large amount of gas in the blood. It was also found extensively present in many of the viscera. Cultures from these organs proved fatal when injected into animals.

Pregnancy and Labor After Abdominal Myomectomy.—WOYER (*Monatschrift für Geburtshülfe und Gynäkologie*, 1897, Band vi., Heft 6) reports the case of a patient, aged thirty-four years, who had been operated upon by abdominal section for the enucleation of a subserous fibroid. She made a good recovery from the operation. There remained, however, an abdominal fistula through which passed a few drops of blood at menstruation. The patient shortly after had an abortion, followed by more bleeding through the fistula.

The patient entered the hospital at the end of pregnancy, the fistula still open and occasionally discharging bloody serum. When labor commenced this discharge was greatly increased and seemed to be made greater by the movements of the fœtus. Meconium was also discharged through the fistula during labor. As birth proceeded the fistula became large enough to admit the finger, which could be passed into the uterus, touching and mapping out the child. The membranes protruded through the fistula. Bleeding and the expulsion of meconium again occurred toward the close of labor, when the child's heart-sounds were irregular. Labor finally terminated spontaneously, the child being stillborn. There was no subsequent bleeding through the fistula. The patient recovered well from labor, and the fistula finally closed spontaneously.

Symphyseotomy in the Country.—In the *Pennsylvania Medical Journal*, 1898, vol. i., No. 8, ARMSTRONG reports the case of a dwarf who had a contracted pelvis. She was in a dirty dwelling in charge of a midwife, who had attempted to deliver her and had pulled out one leg of the child. The patient and her clothing were exceedingly dirty. She was scrubbed as well as possible, and, under chloroform, incision was made directly down on the symphysis, a catheter introduced, the urethra depressed, and the finger passed behind the joint. The pubes was opened with a heavy shoe-knife. The bladder and urethra protruded between the bones after the joint was opened. The child was removed, the uterus emptied and irrigated, the bladder was depressed, and the pelvis brought together. The ligaments and muscles were sewed together with catgut and the skin with interrupted silk sutures. A broad adhesive strip was passed around the trochanters. The patient made a good recovery. Two months after the operation her gait was unsteady, but she had no pain and could move about freely.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

Perineorrhaphy; a New Flap-Operation.—GUBAROFF (*Centralblatt für Gynäkologie*, 1898, No. 48) describes the following modification of Hegar's operation: A crescentic incision is made at the edge of the vulva joining the posterior ends of the labia minora, and a flap of mucous membrane is dissected upward with the finger and blunt scissors; this is held with forceps while a continuous catgut suture is passed through the skin at the upper edge of the wound and along the edge of the flap, emerging through the skin on the opposite side. Sutures of silkworm-gut are then passed beneath the raw surface, so as to include the fascia and levator ani muscle. After tying these the continuous suture is tied, puckering up the flap of mucous membrane. The advantages claimed for the operation are: 1. Simplicity and saving of time; the operation is easily performed under cocaine anæsthesia. 2. There are no sutures within the vagina. 3. No tissue is removed. 4. The pelvic floor is actually restored to its normal condition.

Foreign Bodies within the Uterus.—MITTERMAIER (*Ibid.*) adds reports of two additional cases to the list of twenty-four published by Albertin.

Case I.—The patient stated that she was delivered two years before, and a year after underwent an operation for the removal of a fibroid polypus. A foul discharge persisted, accompanied by chills, fever, and profuse menstruation. Suppuration of the adnexa followed, for which hysterectomy was successfully performed. On examination of the uterus a pedunculated sloughing fibroid the size of a walnut was found at the fundus, the pedicle of which was tied with a silk ligature, that had remained in situ for a year and had been the cause of the serious complications following the former operation.

Case II.—The patient, aged thirty years, was curetted for menorrhagia. In irrigating the uterus a glass catheter broke and the end remained within the uterus, whence it could not be removed. On entering the hospital she had fever, the cervix was contracted, and there was marked tenderness in Douglas's pouch. After dilating the cervix it was impossible to reach the foreign body. The bladder was dissected off, the vesico-uterine pouch opened, and the anterior uterine wall was split with scissors up to the fundus. By holding the flaps apart it was possible to see near the right cornu five pieces of glass embedded in the mucosa and muscular wall. These were removed, the wound was closed with tier-sutures of catgut, and the uterus was replaced and sutured to the vaginal wound. Recovery uninterrupted.

It appeared subsequently that two (!) small glass tubes had been introduced into the uterus simultaneously, one of which was connected with the irrigator, while the other was intended to secure the return flow.

OLDAG (*Deutsche med. Wochenschrift*, 1897, No. 23) reports the case of a woman who stated that for two years before she came under his observation she had habitually introduced into the uterus immediately after coitus a long tube, through which water was injected to prevent conception. On the last occasion the tube broke; it was removed by the writer with some difficulty, after dilating the cervix with laminaria tents. The uterine cavity was irrigated and packed with gauze, and the patient made a good recovery. Three months later she aborted, having, as she insisted, not indulged in sexual intercourse since the accident. The inference was that she was pregnant at the time of the operation, and that the pregnancy was not interrupted by the insertion of the tube or the manipulations necessary to remove it.

Iodoform-ether in the Treatment of Cervical Catarrh.—DOLÉRIS (*Bull. Gênêr. de Thérapeut.*, 1897, No. 11) speaks highly of local applications of iodoform-ether in cases of obstinate cervical endometritis. The iodoform is thought to exercise an antiseptic action, while the ether, by causing strong contraction of the tissues, forces out the contents of the diseased glands.

Emphysema of the Abdominal Wall after Cœliotomy.—LÖNNBERG (*Hygeia; Centralblatt für Gynäkologie*, 1897, No. 49) adds three cases to the nine already reported. In each case the wound was closed with three rows of tier-sutures, in addition to through-and-through sutures; in two drainage was employed. The writer believes that the complication can be avoided by lowering the patient from Trendelenburg's to the horizontal posture and pressing the air out of the peritoneal cavity before tying the last sutures. It is also important that the different layers should be kept in close contact by including contiguous ones in the same sutures.

Hysterectomy for Hæmatometra.—MARGARITO, at the recent International Medical Congress (*La Gynécologie*, October, 1897) advocated abdominal hysterectomy in cases of hæmatometra of long standing, in which the connective and muscular tissue of the uterus becomes so much degenerated that its return to a normal condition is impossible. After evacuating the blood, disturbances in the surrounding organs, adhesions, etc., are apt to occur, which can only be relieved by a radical operation.

Bromine in the Treatment of Endometritis.—NITOT (*Ibid.*) believes that the prophylactic treatment of chronic disease of the uterus and adnexa consists in prompt attention to acute endometritis. To accomplish this it is necessary to resort to some diffusible medicament which can be applied to the entire mucous surface, so as to penetrate between the folds and into the uterine ends of the tubes. He has found in bromine vapor the most satisfactory agent. It is introduced into the uterine cavity through a double-current catheter attached to an atomizer, diffuses rapidly, and exerts a remarkable curative action in cases of acute endometritis and salpingitis.

New Method of Treating Retroflexion.—JONNESCO (*Ibid.*) describes the following method, applicable to cases in which there is no accompanying

disease of the adnexa. The abdomen is opened by a low median incision, the uterus freed from its adhesions and brought forward. A wedge-shaped piece of tissue is excised from the anterior uterine wall at a point opposite to the angle of flexion, and the wound is closed with deep catgut sutures.

The round ligaments are then shortened according to Wylie's method. The writer reports four successful operations.

Secondary Cœliotomy.—NOLTSCHINI (*Ibid.*) concludes a paper on this subject, based on 3160 cases, as follows: 1. Secondary cœliotomy is usually performed for ileus, hemorrhage, obstruction of the ureters, or general peritonitis. 2. The true cause of the formation of adhesions has not been satisfactorily explained, and this complication is none the less frequent since aseptic has been substituted for antiseptic technique. 3. The indications to re-open the abdomen in cases of peritonitis are not clearly defined. 4. Cœliotomy is indicated in ileus, though the mortality is high (38.5 per cent.). 5. The time which intervenes between the first appearance of symptoms of obstruction and surgical interference should have no direct influence. 6. Emaciation, collapse, and intestinal paralysis may serve as contra-indications. 7. While peritonitis, hemorrhage from the slipping of ligatures, and obstruction of the ureters have become rare, through the improvements in technique, there still remain a considerable number of cases of ileus. 8. The prophylaxis of intestinal obstruction depends upon two points —the avoidance of free purgation before operation, which tends to weaken the muscular coat of the gut and cause paralysis, and the elimination of mechanical and chemical irritation of the peritoneum during operation.

Application of Pressure in Treatment of Pelvic Disease.—FEHLING (*Centralblatt für Gynäkologie*, 1897, No. 40) affirms that he is becoming more and more inclined to try the effects of local treatment in cases of chronic inflammation of the adnexa before resorting to surgical measures. His rule is not to operate in the acute stage of infective troubles, to operate if suppuration is established, and in the "intermediate stage" of infiltration or exudation to promote absorption. For the latter purpose he has used the ordinary therapeutic agents—hot douches, iodine, ichthyol, massage, etc.—but now substitutes for them graduated pressure, prolonged daily for several hours. A bag of thick rubber is introduced into the vagina and distended with water. A large bag, weighing several pounds when full, is then applied to the lower part of the abdomen. As the result of this continuous pressure, the vagina is lengthened and dilated, the uterus and adnexa are elevated, and the abdomen is so flattened that it becomes possible to map out the pelvic contents with great distinctness.

This treatment has a marked beneficial effect upon diseased and adherent ovaries and tubes, adherent retroverted uteri, and in cases of cicatricial contraction and non-development of the vagina.

Statistics of Carcinoma Uteri.—THORN (*Ibid.*) calls attention to the contrast between the present low mortality of vaginal hysterectomy for carcinoma uteri (1 to 5 per cent.) and the high percentage of recurrences. Hardly 30 per cent. of the patients have been well at the end of five years. This

unfavorable result he attributes, not to the operation, but to the fact that 70 per cent. of patients are found to be inoperable when they are first examined, while in a considerable proportion of those who are operated upon the disease has already extended beyond the uterus. The latter cases should be carefully separated from those in which the conditions are favorable for a successful extirpation, since in nearly all cases recurrence takes place within two years in the cicatrix. Recurrence due to infection during the operation occurs in only 10 per cent., hence the claim of Mackenrodt for his method of "igni-extirpation" is not based on facts. The writer regards it as a step backward.

Of sixty-two cases in his practice (mortality, 1.6 per cent.) twenty-seven patients had a recurrence within two years, all being "unclean," *i. e.*, the disease was not confined to the uterus at the time of the operation. Of thirty-two favorable cases, only two had a recurrence within two years. Seventeen patients had been operated upon six or more years before; 23.5 per cent. were free from recurrence.

The writer believes that Freund's operation is indicated in certain cases, but he rejects the sacral method on account of the high mortality.

Improvement in statistics will not be accomplished, he says, by devising new surgical methods, but by early diagnosis and early resort to a radical operation. Without the intelligent co-operation of the family physician, it is vain to expect any better results than those which have already been obtained.

Metastases in Vesicular Mole.—PICK (*Ibid.*) reports the following case: In a young woman, four months pregnant, with hemorrhages, a bluish polypoid tumor the size of a walnut was observed on the anterior vaginal wall. A few days later a vesicular mole was removed from the uterus, the patient making a good recovery. She was well three and one-half years later. Sections of the vaginal growth showed typical chorionic villi, on the surface of which was syncytium in active proliferation. The capsule of the tumor consisted of coagulated blood, in which were syncytial outgrowths. The writer infers from a study of this case that true metastases may take place in connection with benign vesicular moles. The large syncytial elements present in the sections examined were identical with the cells described by Neumann in malignant moles, which, he affirmed, were never found except in such growths, and constitute a strong indication for extirpation of the uterus.

Sterilization by Section of the Tubes.—BEUTTNER (*Ibid.*) suggests the following method: The abdomen is opened by a transverse incision just above the symphysis. The Fallopian tubes are divided as far as possible from the uterus, and the four ends are closed with separate sutures, including the muscle and peritoneum. The divided ends are reunited by circular serous sutures (as in circular enterorrhaphy), so that a double septum is formed while the tube retains its normal position.

FRITSCH (*Ibid.*) thinks that in some cases it may be desirable to prevent future conception after performing vagino-fixation in the case of a woman who already has children, considering the risks of pregnancy. Kehrer's

method then offers advantages. The writer reports a case in which he first resected portions of both tubes and then performed vagino-fixation. Ligation is not sufficient, as he once tied both tubes with silk, yet the patient had a child three years later.

The Ovaries in Fibro-myoma of the Uterus. — VAN MEERDERVOORT (*Ibid.*) examined forty-five specimens, reaching the following conclusions: The circulatory changes produced by myomata cause hyaline degeneration of the vessel-walls in the ovary. The stroma usually undergoes a similar degeneration. The number of primordial follicles diminishes, and some degenerate. Follicular and corpus luteum cysts develop. Corpora albicantia are very common, originating from hyaline degeneration of the thickened vessels. Pigmented cells are numerous.

The writer was unable to demonstrate the presence of inflammatory processes. He finds that the usual enlargement of the ovary is due to the formation of corpora albicantia, as well as to the enlargement of follicles and cystic development.

Ovarian Tumors Complicated with Pleurisy.—RESINELLI (*Annali di Ostet. e Genecologia*, 1897, No. 18) concludes an elaborate paper on this subject as follows: Pleuritic effusions in connection with ovarian tumors are to be regarded not as an independent complication, but as a direct result of the presence of the neoplasm. The effusion develops gradually and is unaccompanied by pain or fever. The accumulation of fluid is not due to the presence of the tumor or to changes in the blood, but is really an evidence of metastasis to the pleura, less frequently of peritoneal irritation transmitted through the diaphragm. It is accordingly strong evidence of the malignant character of the tumor, provided that torsion, suppuration of the cyst, etc., can be excluded.

A pleuritic effusion, instead of furnishing a contra-indication to operative interference, may show the necessity of an early operation, provided that the peritoneum is not too extensively involved. In rare cases thoracentesis may be required before cœliotomy is performed, though removal of the tumor is the most direct way of causing the disappearance of the pleuritic fluid.

Action of Extract of Menstrual Blood and of Ovarine on the Blood-Pressure.—FEDEROFF (*Wratch*, No. 26, 1897; *La Gynécologie*, October 15, 1897) injected extracts of menstrual blood, of the mammary glands, and of the ovaries into the blood of rabbits, with the view of noting their influence upon the blood-pressure. His conclusions are as follows: 1. An aqueous solution of the glycerin extract of menstrual blood lowers the pressure in the carotid, increases the heart-action, and accelerates the respirations; the same effect is produced by a similar extract of blood obtained just before menstruation, by an extract made from the endometrium during ectopic gestation, and by an extract of the mammary gland. 2. Ovarine and fresh ovarian extract also raise the pressure, but diminish the heart-action and slow the respiration. 3. In the human female the pressure in the radial is notably increased after the administration of ovarine. 4. Poehl's ovarine

has a marked beneficial effect in the disturbances attending the climacteric, as well as in functional derangements of the ovaries.

Subcutaneous Injections of Saline Solution in Septicæmia.—MANGIN and RAYNAUD (*Ibid.*) report several cases of septic disease of the adnexa in which subcutaneous injections of saline solution were administered before and soon after operation, in quantities varying from 200 to 500 grammes. Their conclusions are thus stated: Injections of artificial serum possess great value in cases of general septic infection, especially at the onset of the disease. The circulation is regulated, the heart-action increased, and the cerebro-spinal system and nutritive functions are stimulated. Diuresis is increased within a few hours, but no appreciable amount of toxic matter is eliminated. The improvement in the general condition is to be ascribed to dilution of the toxins in the blood, which are thus rendered less noxious to the cells. This process of dilution should be continued as long as fresh toxins develop, by the gradual injection of moderate quantities of saline solution.

Artificial serum exercises a most favorable action upon anæmic and asthenic patients, who are exhausted by a long illness or severe operation, and also prevents shock if injected *before* such an operation. The ease and safety of the subcutaneous method and the fact that it may be practised by the unexperienced commend its general use.

Intravenous injections should be reserved for cases in which a very rapid action is necessary, as in profuse hemorrhage, or in desperate cases where subcutaneous absorption is poor because of the depressed condition of the patient.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

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Bacteriology of Milk.—In the early days of bacteriology Sir W. Roberts showed that milk, blood, and urine were in the living body absolutely free from bacteria, and, if drawn through sterilized tubes into sterilized flasks plugged with sterilized cotton wool, would remain unchanged for months or years, without even having been themselves boiled, since it was quite superfluous to sterilize a sterile fluid; not only putrefaction, but the so-called "spontaneous" coagulation of milk, as well as its souring, being brought about by the access of bacteria from without. With the different actions of the *B. coli communis*, *B. typhosus*, etc., we are now well acquainted; and attention has recently been called to the myriads of non-pathogenic bacteria

present in milk and cream as sold. But few serious attempts have been made to differentiate between and to determine the functions of what may be called the normal bacteria of milk, that is to say, those which, under the best possible precautions against extraneous contamination, are invariably present in it by the time it reaches the market. C. Guenther and H. Thierfelder, however, in the *Arch. f. Hygiene*, xxv., come to the conclusion that the "spontaneous" coagulation and lactic fermentation are the work of one particular species which, absent from fresh drawn, is always abundant in curdled milk. It is described by them as 1 μ in length and a half μ in thickness, stationary, not bearing spores, stained by Gram's method, growing best in a solution containing both sugar and albumin, at a temperature of 28° C., and with or without access of air; it does not liquefy gelatin or evolve gases, grows badly on potato, and forms on the surface of agar a film like fine dew. A. Luebert, *Zeitsch. f. Hyg.*, describes a spontaneous peptonization which milk occasionally undergoes, rendering it highly deleterious to infants, though drunk with impunity by adults. The agent in this change is the *bac. i.* of Flügge, a short, thick, very mobile organism, having no action on sugar or fat, but liquefying serum gelatin and peptonizing albumins to the extent of 93 per cent. in twenty-four hours. The poison is not in the caseoses or peptones formed, but in the bodies of the bacilli themselves. Abstracts of both papers may be seen in the *Hyg. Rundschau*, vi., pages 506 and 851, respectively.

Milk Preservatives.—Salicylic acid, carbonate of soda, and borax are the chief ingredients of the presevatives so much used by the small retail dealers who do not, like the larger firms, put their surplus milk at the close of each day through a separator, converting it into butter, but carry it over to the next to be mixed with the fresh milk or to be sold to their less fastidious and poorer customers. Salicylic acid or salicylate of soda is easily detected by the color it gives with ferric chloride, but for soda and borax, P. Solomon, *Hyg. Rundschau*, vi., 506, recommends the method of Tscherbakoff as the best preliminary test. It consists in the addition of 10 c.cms. of the milk to the same volume of alcohol of the strength of 95 per cent., when it will coagulate in large clots unless soda or borax be present. Even as little as 0.06 per cent. of soda, though it does not prevent, delays coagulation for five minutes, and the clots which then fall are small and quite unlike those produced by the alcohol in pure milk. Of course, a positive result should be verified by more exact analysis before legal proceedings are taken. Formalin, however, is fast coming to the front, and for it other tests must be found.

Toxicity of Sweat—Ochlosis.—ARLOING belongs to the "old school," who, despite the *negative* results obtained by analysis, adhere to the beliefs that excess of CO_2 and deficiency of O_2 in the expired air are not sufficient to explain the phenomena of *ochlotic* poisoning, differing as they do from those following descent into wells, vaults, or vats in which CO_2 has accumulated, and from those of "mountain sickness" and of balloon ascents, where O_2 alone is deficient, and that the presence in the breath and probably still more in the exhalations from the body of some organic poison, perhaps

capable of baffling the resources of chemists for many years to come, must be assumed to account for the symptoms and phenomena in question, and has shown that the sweat, at any rate, possesses a high degree of toxicity.

Having steeped in distilled water the vest of a man who had been dancing throughout a long evening, he injected the liquid into several dogs. They became drowsy, were taken with violent diarrhœa, and died in a few hours. The autopsies showed congestion of the entire alimentary canal, yellow patches on the liver surface, whitish clots occupying the cavity of the heart, and the auriculo-ventricular valves patent. The symptoms induced in rabbits by the sweat from the same person's drawers, or lower limbs, were different—viz., excitement, erethism, clonic spasms, followed by paralytic phenomena and death. There is no question here of O_2 and CO_2, nor are the symptoms, especially as exhibited in the rabbits, those of common septicæmia or sapræmia, nor, again, would such small doses of kreatin appear adequate; and one is driven to the conclusion that toxic products of the waste of the tissues are eliminated by the skin and possibly by the lungs also; at any rate the former source cannot be denied, and until the chemists have demonstrated the cutaneous it ill becomes them to deny the pulmonary poison.

[Personally, however, I am quite prepared to renounce the latter, believing that the former is the chief factor in ochlotic poisoning, the milder forms of which are felt inversely as the cleanliness of the crowd, being more painfully felt by the susceptible person, like myself, after some hours passed in a law court, especially the police and county courts, a primary school, or a theatre, than in a church, concert, or private reception-room, however crowded. Where there is a stench there must be something more than an excess of inodorous CO_2, and, however interesting to the physiologist, it matters not to the practical sanitarian (save as an argument in favor of public baths) whether the immediate cause of ochlotism be exhaled from the pulmonary or the cutaneous surfaces, not to mention the buccal cavity and interstices between the teeth. Indeed, I believe that "o'clo's" play an important part in the production of "ochlosis."—E. F. W.]

But these crude observations of M. Arloing promise, if verified, to open up wide fields for pathological research. His dancer was presumably in the enjoyment of good health; but we must have biological and chemical examinations of the sweat in rheumatic fever, in acute gout, nephritis, etc., following chills, in scarlatina, etc., and in habitual malassimilation of food, habitual urinary deposits, etc. What light might not be thrown on the consequences of chills in apparently inducing, and certainly in aggravating and complicating, a large number of febrile pathological states, as well as on the relation between eruptions and defective or excessive cutaneous secretions, and the elimination of drugs or the poisons of disease.

"Natural" Treatment of Sewage.—An interesting experiment is being carried out at Exeter, a city of 40,000 inhabitants. The engineer, Mr. Donald Cameron, being called on to purify the sewage before discharging it into the river, refused to use any chemicals which would have the effect of destroying along with the bacteria of putrefaction those in whose function of resolving all organic matter into its ultimate components, CO_2, NH_3, and H_2O, rests the entire process of self-purification of water, as well as of the treatment of sewage by irrigation, and the theory of manures.

He determined to trust wholly to the unchecked action of these organisms by storing the crude sewage in huge covered tanks until the reduction of the organic matter was complete, and thus far the results have been satisfactory. No sludge is formed, and after six months there is only a thin deposit of sand and earthy matter; but a thick scum forms on the surface of the tank, the constituents of which are constantly sinking and rising, though within a range of a few inches only. The effluent is comparatively clear and inoffensive, not fit to turn into a river, but eminently suited for irrigation, since it contains the whole of the nitrogen in the form of non-volatile ammonium salts, while free from the glutinous, crude matters which tend to clog the soil.

The bacteria in the dark, closed tanks are anaërobic, resolving albumin into ammonia, while the nitrifying bacteria of the earth are aërobic and oxidize the ammonia into nitric acid. The effluent intermittently filtered through loose coke breeze is rendered nearly colorless and quite free from smell—in fact, fit to be discharged into any river.

Alcoholic Fermentation Produced by Fluids of Living Cells.—Prof. Buchner has succeeded in obtaining a clear yellow fluid by crushing yeast and compressing the cells with a pressure of from 400 to 500 atmospheres. After every vestige of the living cell has been removed by filtration, the fluid displays the important property of producing alcoholic fermentation, thus refuting the hitherto accepted idea that fermentation is associated only with the presence of the living cell.

Disinfection of Sewers.—Dr. C. R. C. Tichborne (*Dublin Journal of Medical Science*, July, 1897) shows by experiment that if by means of a pipette we pass a layer of carbolic acid into a shallow dish of water, and after it has stood some little time, draw off some of the supernatant water and test it with bromine, it will be found to contain no carbolic acid. Using a mixture of crude carbolic acid and the light oil of tar ("light coal-tar oil"), which is especially rich in the benzene, napthalene, and terebene series, the mixture having a specific gravity of 0.850 to 0.950, we find on introducing it into the water with the pipette that it immediately rises to the surface, and if some of the water be removed at once from the interior and tested with bromine, it will show the presence of carbolic acid and napthalene. Hence, instead of adding a heavy disinfectant which sinks to the bottom, we should use one which disinfects from the surface downward.

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